

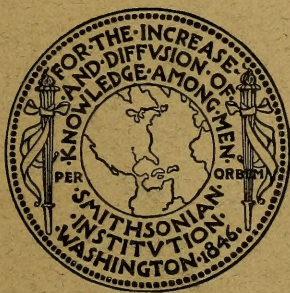
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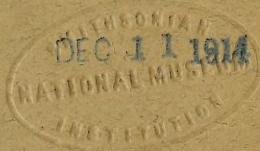
REPORT OF THE SECRETARY  
OF THE SMITHSONIAN  
INSTITUTION

FOR THE YEAR ENDING JUNE 30

1914



(Publication 2317)



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
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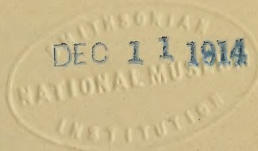
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# REPORT

OF THE

## SECRETARY OF THE SMITHSONIAN INSTITUTION

CHARLES D. WALCOTT

FOR THE YEAR ENDING JUNE 30, 1914.

*To the Board of Regents of the Smithsonian Institution:*

GENTLEMEN: I have the honor to submit herewith a report on the operations of the Smithsonian Institution and its branches during the fiscal year ending June 30, 1914, including work placed by Congress under the direction of the Board of Regents in the United States National Museum, the Bureau of American Ethnology, the International Exchanges, the National Zoological Park, the Astrophysical Observatory, and the United States Bureau of the International Catalogue of Scientific Literature.

The general report reviews the affairs of the Institution proper and briefly summarizes the operations of its several branches, while the appendices contain detailed reports by the assistant secretary and others directly in charge of various activities. The reports on operations of the National Museum and the Bureau of American Ethnology will also be published as independent volumes.

### THE SMITHSONIAN INSTITUTION.

#### THE ESTABLISHMENT.

The Smithsonian Institution was created an establishment by act of Congress approved August 10, 1846. Its statutory members are the President of the United States, the Vice President, the Chief Justice, and the heads of the executive departments.

#### THE BOARD OF REGENTS.

The Board of Regents consists of the Vice President and the Chief Justice of the United States as ex officio members, three Members of the Senate, three Members of the House of Representatives, and six citizens, "two of whom shall be resident in the city of Washington, and the other four shall be inhabitants of some State, but no two of them of the same State."

In regard to the personnel of the board, it becomes my sad duty to record the death on December 22, 1913, of Representative Irvin

S. Pepper, and of Senator Augustus O. Bacon, who died February 14, 1914. Representative Maurice Connolly has been appointed to succeed Mr. Pepper and Senator Henry French Hollis to succeed Senator Bacon. Representative Ernest W. Roberts has been appointed as successor to Representative John Dalzell, whose term of office as Member of Congress had expired.

The roll of Regents at the close of the fiscal year was as follows: Edward D. White, Chief Justice of the United States, Chancellor; Thomas R. Marshall, Vice President of the United States; Henry Cabot Lodge, Member of the Senate; Henry French Hollis, Member of the Senate; William J. Stone, Member of the Senate; Scott Ferris, Member of the House of Representatives; Maurice Connolly, Member of the House of Representatives; Ernest W. Roberts, Member of the House of Representatives; Andrew D. White, citizen of New York; Alexander Graham Bell, citizen of Washington, D. C.; George Gray, citizen of Delaware; Charles F. Choate, jr., citizen of Massachusetts; John B. Henderson, jr., citizen of Washington, D. C.; and Charles W. Fairbanks, citizen of Indiana.

At its meeting on January 15, 1914, the board filled a vacancy in the Executive Committee by the election of Hon. Maurice Connolly.

The annual meeting of the Board of Regents, adjourned from December 11, 1913, was held on January 15, 1914, and the proceedings of the meeting have been printed as usual for the use of the Regents, while such important matters acted upon as are of public interest are reviewed under appropriate heads in the present report of the secretary. The annual financial report of the Executive Committee has also been issued in the usual form, and a detailed statement of disbursements from Government appropriations under the direction of the Institution for the maintenance of the National Museum, the National Zoological Park, and other branches will be submitted to Congress by the secretary in the usual manner in compliance with the law.

#### GENERAL CONSIDERATIONS.

The "increase of knowledge" is one of the fundamental objects of the Smithsonian Institution, and one of the first acts of the Board of Regents in 1847 was to formulate a general plan of operations to carry out that purpose. Among the examples of lines of work for which appropriations were to be made from time to time were the following:

- (1) System of extended meteorological observations for solving the problem of American storms.
- (2) Explorations in descriptive natural history, and geological, mathematical, and topographical surveys, to collect material for the formation of a physical atlas of the United States.



(3) Solution of experimental problems, such as a new determination of the weight of the earth, of the velocity of electricity and of light, chemical analyses of soils and plants, collection and publication of articles of science accumulated in the offices of the Government.

(4) Institution of statistical inquiries with reference to physical, moral, and political subjects.

(5) Historical researches, and accurate surveys of places celebrated in American history.

(6) Ethnological researches, particularly with reference to the different races of men in North America; also explorations and accurate surveys of the mounds and other remains of the ancient people of our country.

It has been the aim of the Institution throughout its history to accomplish as much as practicable in all the fields of research above enumerated, and the secretaries of the Smithsonian have in their turn been chosen by the regents with that end in view. The first secretary, Professor Henry, was a physicist, and researches during his administration were largely in the domain of physics.

The present United States Weather Bureau is an outgrowth of the system of meteorological observations and warnings established by the Smithsonian Institution. In 1847 an appropriation was made "for instruments and other expenses connected with meteorological observations." The instruments thus secured were distributed throughout the country, and within two years the volunteer observers reporting to the Institution numbered about 400. In 1849 Henry realized the value of the electric telegraph as "a ready means of warning the more northern and southern observers to be on the watch for the first appearance of an advancing storm," and there was inaugurated a system of daily telegraphic weather reports, a system which was continued under the direction of the Institution until the beginning of the Civil War. On a large map in the Smithsonian building the weather over a considerable part of the country, according to reports received at 10 o'clock each day, was indicated by suitable symbols.

Under the second secretary, Professor Baird, biological science was one of the principal fields of research. It was during his administration that there was organized the United States Fish Commission for the study of the food fisheries of the United States, and Prof. Baird served as head of that commission until his death. The organization later became the United States Bureau of Fisheries of the Department of Commerce. Prof. Baird took a deep interest in the National Museum, and under his direction there was erected a building for the exhibition of the valuable collections acquired from the International Exhibition at Philadelphia in 1876.

Professor Langley, the third secretary, was both an astronomer and a physicist. But to his deep devotion to those professions may be added a broad view of the entire field of human knowledge. It was

during the administration of Langley that the Astrophysical Observatory was established to carry forward researches begun by him many years before. And the National Zoological Park, largely the outgrowth of investigations on living animals under the direction of Assistant Secretary Goode, was likewise founded during Langley's administration. To Langley himself the world owes a debt for his discoveries of the principles of aerial navigation and for his demonstration to the world on May 6, 1896, by the successful flight of an experimental machine, that an aeroplane heavier than air could be propelled through the air by its own power.

It would be interesting, were this the proper place, to review some of the results of the many important researches and explorations by the Institution in the last 60 years. The influence of the Institution is world-wide; through its international exchange service alone it has been in correspondence with more than 60,000 individuals and learned societies in the United States and practically in every land on the globe. During its entire existence there has been an unbroken record of friendly intercourse with every agency devoted to the encouragement of learning.

The extent of the activities of the Institution is limited only by the amount of the funds available. During recent years its private income has been supplemented on several occasions by friends of the Institution who have generously provided the means for carrying on certain explorations and lines of research, but opportunities for further important work constantly arise which must be declined or temporarily held in abeyance. Some of the projects proposed are such as could not properly be carried on through Government appropriation, but which the Smithsonian Institution could readily undertake were the means available.

The Institution was founded by the bequest of James Smithson, and from time to time it has been the recipient of other bequests and of gifts of various sums, the largest of which was the gift of Mr. Thomas G. Hodgkins, establishing the Hodgkins Fund. The Smithsonian permanent fund now aggregates a little more than a million dollars. A number of bequests, now awaiting settlement, will eventually result in considerably increasing the present fund. Among these I may mention—

*Poore bequest.*—By the terms of the will of the late George W. Poore, of Lowell, Mass., who died December 17, 1910, the Smithsonian Institution becomes his residuary legatee. As mentioned in my 1910 report, the estate, estimated at about \$40,000, is bequeathed under the condition that the income of this sum should be added to the principal until a total of \$250,000 should have been reached, and that then the income only should be used for the purposes for which the Institution was created.

As a reason for making this bequest to the Smithsonian Institution Mr. Poore in his will says:

I make this gift not so much because of its amount as because I hope it will prove an example for other Americans to follow, by supporting and encouraging so wise and beneficent an institution as I believe the Smithsonian Institution to be, and yet it has been neglected and overlooked by American citizens.

The affairs of this estate are being adjusted by the executor as rapidly as circumstances will permit.

*Reid bequest.*—In 1903 the Institution was informed of a proposed bequest to the Institution from Mr. Addison T. Reid, of Brooklyn, N. Y., to found a chair of biology in memory of the testator's grandfather, Asher Tunis. The bequest was subject to the condition that the income was to be paid in three equal shares to certain named legatees until their death, when the principal of the estate (then estimated at \$10,000), with accumulations, was to come to the Institution. One of the beneficiaries having died, the trust created for her benefit, amounting to \$4,795.91, was received by the Institution during the past year and deposited to the credit of the permanent fund in the United States Treasury.

*Loeb bequest.*—By the will of Morris Loeb, of New York City, the Smithsonian Institution is made a residual legatee and is to receive a one-tenth share of the estate remaining upon the death of the testator's wife. This legacy is to be used for the furtherance of knowledge in the exact sciences.

Morris Loeb, chemist, was born at Cincinnati May 23, 1863, and died October 8, 1912. He graduated from Harvard University in 1883 with the degree of A. B. and received the degree of Ph. D. from the University of Berlin in 1887 and Sc. D. from Union University in 1911. In 1891 he became professor of chemistry at the New York University. He was vice president of the American Chemical Society, and a member of the German Chemical Society and other scientific bodies.

*Lucy Hunter Baird bequest.*—Miss Baird, daughter of the late Spencer Fullerton Baird, Secretary of the Institution, died June 23, 1913. Besides giving to the National Museum and the Smithsonian Institution certain books, manuscripts, and other articles, the will of Miss Baird provides that upon the release of any portion of the trust estate by the death of the person entitled to the income thereof, said trust estate shall be given "to the Smithsonian Institution in trust as a fund to be known as 'the Spencer Fullerton Baird fund,' the interest shall be devoted, under the direction of the Smithsonian Institution to the expenses in whole or in part of a scientific exploration and biological research or for the purchase of specimens of natural objects or archæological specimens."

*Chamberlain bequest.*—In 1886 the National Museum received by bequest of Dr. Isaac Lea, of Philadelphia, an unrivaled collection of fresh-water mussels; and in 1894 a collection of gems and precious stones, also made by Dr. Lea, was bequeathed to the Museum by his daughter, Frances Lea Chamberlain, wife of Rev. Dr. Leander T. Chamberlain. Mrs. Chamberlain had taken a deep interest in her father's collections and had added materially thereto. Upon her death in 1894, Dr. Chamberlain assumed the trust and until his death in May, 1913, made large additions, particularly to the collection of gems and precious stones and in consequence of his gifts and collaboration was appointed honorary associate in mineralogy in the Museum.

In his will, Dr. Chamberlain bequeathed \$25,000 to the Smithsonian Institution to be known as the "Frances Lea Chamberlain fund," the income of which shall be used for "promoting the increase and the scientific value and usefulness of the Isaac Lea collection of gems and gem material," and the additional sum of \$10,000 as a fund, the income of which shall be used for promoting the scientific value and usefulness of the Isaac Lea collection of mollusks.

*Sprague bequest.*—Mr. Joseph White Sprague, of Louisville, Ky., died in Italy in June, 1900. His will provides that 85 per cent of the total income of the estate is to be distributed among certain devisees until their death, and then to several of their relatives for 20 years after the death of the last devisee, when the trust expires by limitation, and is to be paid to the Smithsonian Institution and to be known as "The Sprague Fund." Its purpose is to best promote the advancement of the physical sciences, and only one-half of each annual income is to be used, the other half to be added to the principal of the estate. In 1901, the estate was estimated to be worth \$200,000.

*Fitzgerald bequest.*—The will of Mr. Riter Fitzgerald, of Philadelphia, who died in 1911, makes certain definite bequests and leaves all the rest, residue and remainder of the estate, to his executors in trust, the net income to be paid quarterly to his niece, and should she die without leaving a child or children, the principal of the estate and interest accrued thereon is to be given "to the United States National Museum of the Smithsonian Institution, Washington, D. C." This part of the estate is appraised at between \$12,000 and \$13,000.

#### FINANCES.

The permanent fund of the Institution and the sources from which it was derived are as follows:

##### *Deposited in the Treasury of the United States.*

Bequest of James Smithson, 1846.....	\$515, 169. 00
Residuary legacy of James Smithson, 1867.....	26, 210. 63
Deposit of savings of income, 1867.....	108, 620, 37

Bequest of James Hamilton, 1875.....	\$1,000	
Accumulated interest on Hamilton fund, 1895.....	1,000	
		\$2,000.00
Bequest of Simeon Habel, 1880.....		500.00
Deposits from proceeds of sale of bonds, 1881.....		51,500.00
Gift of Thomas G. Hodgkins, 1891.....		200,000.00
Part of residuary legacy of Thomas G. Hodgkins, 1894.....		8,000.00
Deposit from savings of income, 1903.....		25,000.00
Residuary legacy of Thomas G. Hodgkins, 1907.....		7,918.69
Deposit from savings of income, 1913.....		636.94
Bequest of William Jones Rhees, 1913.....		251.95
Deposit of proceeds from sale of real estate (gift of Robert Stan- ton Avery), 1913.....		9,692.42
Bequest of Addison T. Reid, 1914.....		4,795.91
Deposit of savings from income Avery bequest, 1914.....		204.09
		<hr/>
Total of fund deposited in the United States Treasury.....		960,500.00

## OTHER RESOURCES.

Registered and guaranteed bonds of the West Shore Railroad Co., part of legacy of Thomas G. Hodgkins (par value).....		42,000.00
		<hr/>
Total permanent fund.....		1,002,500.00

With the aid of the first installment of \$4,795.91 of a bequest from the late Addison T. Reid and a small deposit from savings of income from the Avery bequest, the permanent fund now, for the first time, exceeds \$1,000,000.

That part of the fund deposited in the Treasury of the United States bears interest at 6 per cent per annum, under the provisions of the act organizing the Institution and an act of Congress approved March 12, 1894. The rate of interest on the West Shore Railroad bonds is 4 per cent per annum.

The income of the Institution during the year, amounting to \$90,982.54, was derived as follows: Interest on the permanent foundation, \$58,994.29; contributions from various sources for specific purposes, \$17,554.20; first installment of a bequest from the late Addison T. Reid, \$4,795.91; and from other miscellaneous sources, \$9,638.14; all of which was deposited in the Treasury of the United States.

With the balance of \$33,641.40 on July 1, 1913, the total resources for the fiscal year amounted to \$124,623.94. The disbursements which are given in detail in the annual report of the executive committee, amounted to \$94,063.81, leaving a balance of \$30,560.13 on deposit June 30, 1914, in the United States Treasury and in cash.

The Institution was charged by Congress with the disbursement of the following appropriations for the year ending June 30, 1914:

International exchanges.....	\$32,000
American Ethnology.....	42,000
Astrophysical Observatory.....	13,000

## National Museum:

Furniture and fixtures.....	\$50,000
Heating and lighting.....	50,000
Preservation of collections.....	300,000
Books.....	2,000
Postage.....	500
Building repairs.....	10,000
Bookstacks for Government bureau libraries.....	15,000
National Zoological Park.....	100,000
Readjustment of boundaries, National Zoological Park.....	107,200
International Catalogue of Scientific Literature.....	7,500
Total.....	729,200

In addition to the above specific amounts to be disbursed by the Institution, there was included under the general appropriation for public printing and binding an allotment of \$76,200 to cover the cost of printing and binding the annual report and other Government publications issued by the Institution, and to be disbursed by the Public Printer.

## RESEARCHES AND EXPLORATIONS.

During the past year the Institution has continued to carry on investigations in various lines throughout the world by means of small allotments from its funds. It has also accomplished a great deal in the way of exploration and research through the generosity of friends of the Institution, who have contributed funds for special work or provided opportunities for participation in explorations which they had undertaken personally or through the aid of others. Each year, however, the Institution is obliged to forego opportunities for important investigations through lack of sufficient funds.

I can here only briefly mention some of the work in progress under the Smithsonian Institution proper during the past year, while accounts of activities connected with the Astrophysical Observatory, the Bureau of American Ethnology, and the United States National Museum are given in other parts of this report by those in direct charge of those branches of the Institution.

## THE LANGLEY AERODYNAMICAL LABORATORY.

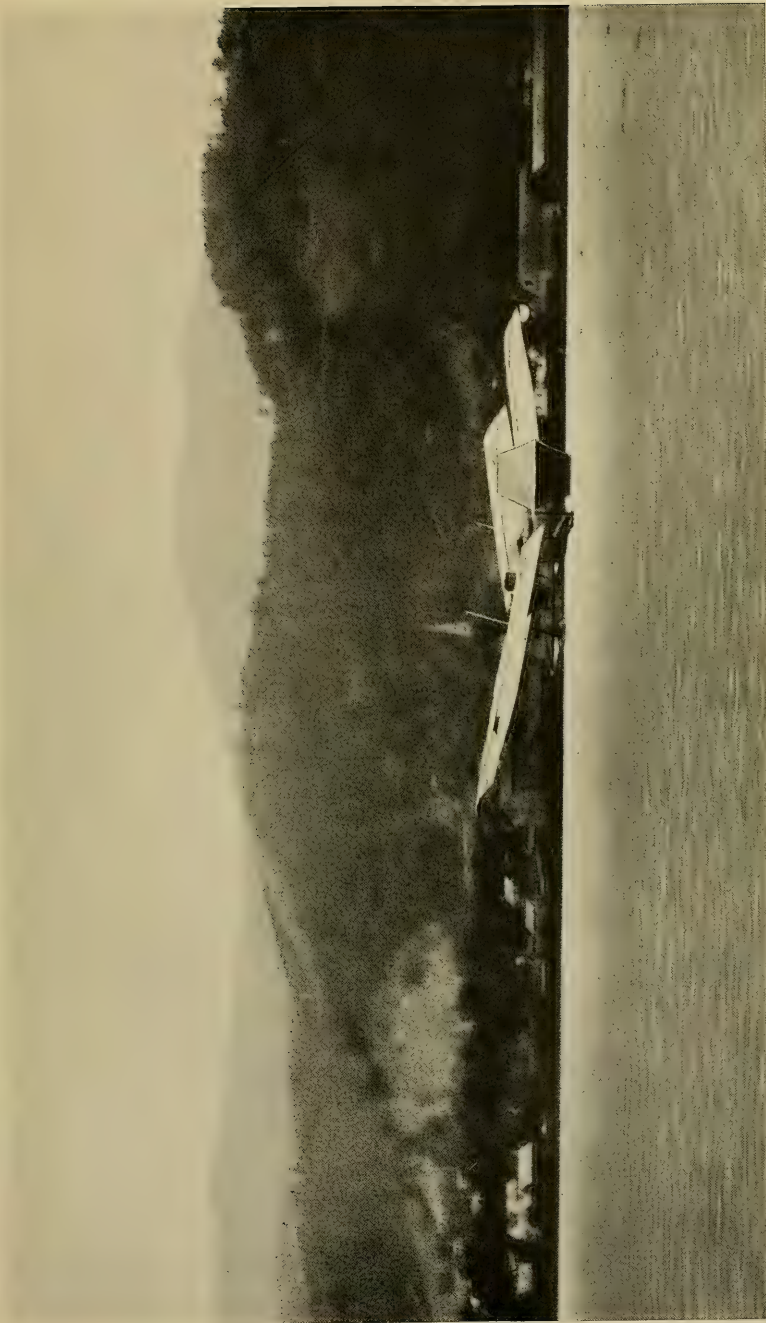
By resolution of the Regents on May 1, 1913, the secretary was authorized to reopen the Smithsonian Institution laboratory for the study of aerodynamics and to be known as the Langley Aerodynamical Laboratory. The functions of the laboratory were defined to be the study of the problems of aerodynamics, particularly those of aerodynamics, with such research and experimentation as may be necessary to increase the safety and effectiveness of aerial locomotion for the purposes of commerce, national defense, and the welfare of man.





LANGLEY MAN-CARRYING AERODROME (BUILT 1898-1903) EQUIPPED WITH FLOATS, IN FLIGHT OVER LAKE KEUKA, HAMMONDSPORT, N. Y.,  
JUNE 2, 1914.





LANGLEY MAN-CARRYING AERODROME (BUILT 1898-1903) EQUIPPED WITH FLOATS, IN FLIGHT OVER LAKE KEUKA, HAMMONDSPORT, N. Y.,  
JUNE 2, 1914.



The Regents also authorized the secretary to appoint an advisory committee; to add, as means are provided, other laboratories and agencies; to group them into a bureau organization; and to secure the cooperation with them of the Government and other agencies.

In accordance with the above general plan an advisory committee was organized at a meeting convened at the Institution on May 23, 1913. The official status, organization, agencies, resources, and facilities of this committee were set forth in a statement in my last report.

The first year's work of the laboratory was to arrange a comprehensive program of operations, devise ways and means of carrying on investigations and publishing reports, conduct such active experiments as were possible with the means immediately available, and to secure and arrange in the library the best aeronautical literature.

The reports of the committee thus far published have appeared as individual papers in the Smithsonian Miscellaneous Collections. The first of these recounts the organization of the advisory committee and the resources of the Langley laboratory. The first technical publication sets forth the results of experiments made at the model tank at the Washington Navy Yard. Another report describes the organization and equipment of the leading aeronautical laboratories of England, France, and Germany. Some of the reports of the committee are as yet confidential or incomplete. The library has been furnished with the chief aeronautic periodicals and the best books thus far published.

The rehabilitation and successful launching of the Langley aeroplane (called "aerodrome" by Prof. Langley), constructed over a decade ago, was accomplished in May, 1914. The machine was shipped from the Langley laboratory to the Curtiss aeroplane factory in April. It was recanvassed and provided with hydroaeroplane floats, and was launched on Lake Keuka on May 28. With Mr. Glenn H. Curtiss as pilot it ran easily over the water, rose on level wing, and flew in steady poise 150 feet. Subsequent short flights were made in order to secure photographs of the craft in the air. Then Mr. Curtiss was authorized, in order to make prolonged flights without overtaxing the bearings of the Langley propulsion fixtures, to install in its place a standard Curtiss motor and propeller. At the close of the fiscal year the experiments were still making satisfactory progress.

The tests thus far made have shown that the late Secretary Langley had succeeded in building the first aeroplane capable of sustained free flight with a man. It is hoped that further trials will disclose the advantages of the Langley type of machine. It may be recalled that this man-carrying aeroplane was begun in 1898 for the War

Department, and in the interest of the national defense. It was built on the design of the model machine which, on May 6, 1896, first demonstrated to the world that an aeroplane heavier than air could be propelled through the air by its own power. The large machine was completed in 1903, but its actual flight was at that time hindered by injuries sustained through defects in the launching apparatus.

The numerous and comprehensive aerotechnical investigations planned for the Langley laboratory can be successfully carried out only when increased funds are available. Properly equipped and endowed, the laboratory would serve as a national aeronautical institute suitable for conducting the aerotechnical investigations and tests required by the Government and the aeronautical industries of this country.

#### GEOLOGICAL EXPLORATIONS IN THE CANADIAN ROCKIES.

In continuation of my previous geological researches in the Canadian Rockies, I revisited during the field season of 1913 the Robson Peak district, in British Columbia and Alberta, and the region about Field, British Columbia. At the latter place I met the members of the International Geological Congress.

On this trip Robson Peak was approached from the west side in order to study the local geological section, one of the finest in the world. From the west foot of Robson Peak, Whitehorn Peak rises on the north to a height of 7,850 feet above Lake Kinney, and on the east the cliffs of Robson rise tier above tier from the surface of the lake to the summit of the peak, a vertical distance of 9,800 feet.

From beneath the base of the mountain at Lake Kinney the strata curve gently outward, so that upwards of 4,000 feet in thickness of beds that are beneath Robson Peak are exposed in their extension to the west and south.

Owing to exceptionally good climatic conditions the season of 1913 proved unusually favorable for studying Robson Peak. Frequently in the early morning the details of the snow slopes and bedded rocks on the summit of the peak were beautifully outlined, but toward evening the mists, driven in from the warm currents of the Pacific, 300 miles away, shrouded the mountain from view.

From the west slopes of Titkana Peak, east of the great Hunga Glacier, a wonderful view is obtained of the snow fields and falling glaciers east and north of Robson Peak. The glacial streams come tumbling down the slopes and often disappear beneath the glacier to reappear at its foot with the volume of a river.

At Field, British Columbia, work was continued at the great middle Cambrian fossil quarry, where a large collection of specimens

was secured. It was necessary to do much heavy blasting to reach the finest fossils which occur in the lower layers of rock.

The collection of 1913 contains a number of very important additions to this ancient fauna and many fine specimens of species found in 1912. A report on these collections is now in preparation.

An illustrated account of my previous exploration in the Robson Peak district was published in the Smithsonian Miscellaneous Collections, Vol. 57, No. 12, and a paper with panoramic view, entitled "The Monarch of the Canadian Rockies," appeared in the National Geographic Magazine, May, 1913. Three other reports of my studies were published in the Smithsonian Miscellaneous Collections, entitled "New Lower Cambrian Subfauna," "*Dikelocephalus* and other genera of the *Dikelocephalinae*," and "The Cambrian Faunas of Eastern Asia." A report on "The Cambrian and its Problems in the Cordilleran Region" is now in press in a new volume of the Dana commemorative course at Yale University. The investigations discussed in this paper were continued in a report, "Pre-Cambrian Algonkian Algal Flora," in the Smithsonian Miscellaneous Collections, and preparations were made for further study of the subject in the Rocky Mountains of Montana during the field season of 1914. This was successfully carried out with the acquisition of several tons of specimens.

#### GEOLOGIC HISTORY OF THE APPALACHIAN VALLEY IN MARYLAND.

Dr. R. S. Bassler, of the National Museum, spent a month during the summer of 1913 in the Appalachian Valley of Maryland and the adjoining States, studying the postpaleozoic geologic history of the region, as indicated by the present surface features. His studies, which were under the joint auspices of the United States National Museum and the Maryland Geological Survey, were in continuation of work carried on during the previous summer, when the sedimentary rocks of the region were mapped in detail.

Since Carboniferous times western Maryland has been above the sea, and its rocks have accordingly been subjected to a long period of aerial erosion. During Jurassic time the area remained stationary for so long a period that the surface of the land in the Appalachian province was reduced to a rolling plain. Later uplift raised this plain still higher above sea level, and in Maryland only remnants of the old surface are preserved in the flat sky line of the highest mountains. This ancient plain, or Schooley peneplain, as it is termed, is well preserved on the top of the Blue Ridge.

A second great period of erosion occurred in early Tertiary times, the effects of which were chiefly in the Appalachian Valley proper, where the erosion is indicated by a pronounced plain at an elevation

of about 750 feet. This plain was formed only on the softer Paleozoic rocks, and, because of its prominence near Harrisburg, Pa., is known as the Harrisburg peneplain. Conococheague Creek traverses the Harrisburg peneplain in Maryland, and has dissected it considerably, but the even sky line of the ancient plain is still clearly evident.

Other factors in the geologic history of Maryland are recorded in the well-defined gravel terraces along the major streams of the area and in great alluvial fans of large and small boulders, spreading out at the foot of the larger mountains and sometimes reaching a depth of 150 feet.

#### PLEISTOCENE CAVE DEPOSIT IN MARYLAND.

As the results of a further examination of the Pleistocene cave deposit near Cumberland, Md., by Mr. J. W. Gidley, of the National Museum, many new forms were added to the collection, and much better material obtained of several species represented only by fragments of jaws in the first collection. The series now includes more than 300 specimens, representing at least 40 distinct species of mammals, many of which are extinct. Among the better preserved specimens are several nearly complete skulls and lower jaws. The more important animals represented are two species of bears, two species of a large extinct peccary, a wolverine, a badger, a martin, two porcupines, a woodchuck, and the American elandlike antelope.

Other species represented by more fragmentary material include the mastodon, tapir, horse, and beaver, besides several species of the smaller rodents, shrews, bats, and others.

This strange assemblage of fossil remains occurs hopelessly intermingled and comparatively thickly scattered through a more or less unevenly hardened mass of cave clays and breccias, which completely filled one or more small chambers of a limestone cave, the material, together with the bones, evidently having come to their final resting place through an ancient opening at the surface a hundred feet or more above their present location. The deposit is exposed at the bottom of a deep railroad cut which first brought to light this ancient bone deposit and incidentally made access to the fossils comparatively easy.

#### GEOLOGICAL SURVEY OF PANAMA.

A statement was made in my report for last year that an allotment had been made from the Institution's funds toward the expenses of an investigation of the geology of Panama. This work is in progress under the joint auspices of the Isthmian Canal Commission, the United States Geological Survey, and the Smithsonian Institution. The general plan includes a systematic study of the physiography, stratigraphy and structural geology, geologic history, geologic correlation, mineral resources (including coal, oil, and other

fields), petrography and paleontology of the Canal Zone, and of as much of the adjacent areas of the Isthmian region as is feasible.

Upon the completion of the work the Institution will print a general account of the results, and later there will be published a detailed report of the geological data of the Isthmus and adjoining regions.

#### VERTEBRATE FOSSIL REMAINS IN MONTANA.

During the summer of 1913 Mr. Charles W. Gilmore, of the National Museum, headed an expedition for the purpose of obtaining a representative collection from northwestern Montana.

A camp was established on Milk River, on the Blackfeet Indian Reservation, and four weeks were spent there in collecting, the work being confined entirely to the Upper Cretaceous (Belly River beds) as exposed in the bad lands for 10 miles along this stream. The camp was then moved some 50 miles south on the Two Medicine River, and two weeks were spent working in the same geological formation. Between 500 and 600 separate fossil bones were obtained, many of them of large size. The most notable discovery was a new Ceratopsian or horned dinosaur, the smallest of its kind known. There were portions of five individuals of this animal recovered, representing nearly all parts of the skeleton, making it possible to mount a composite skeleton for exhibition. Although Ceratopsian fossils were first discovered in the Rocky Mountain region in 1855, and portions of a hundred or more skeletons have been collected, this is the first individual to be found having a complete articulated tail and hind foot. It thus contributes greatly to our knowledge of the skeletal anatomy of this interesting group of extinct reptiles.

Another find was a partial skeleton of one of the Trachodont or duck-billed dinosaurs recently described from specimens obtained in Canada, and its discovery in Montana greatly extends its known geographical and geological range. Less perfect skeletons of carnivorous and armored dinosaurs, turtles, crocodiles, and ganoid fishes were also obtained.

#### FOSSIL ECHINODERMS IN ILLINOIS.

The special field explorations maintained by Mr. Frank Springer, associate in paleontology in the United States National Museum, were continued during the season of 1913 by his private collector, Frederick Braun. The purpose of these explorations is to obtain additional material for use in Mr. Springer's monographs upon the fossil crinoidea, now in course of preparation, but they also result in important accessions of excellent specimens for the completion of the exhibition series in the halls of Invertebrate Paleontology in the National Museum.

The investigations of the past summer were confined to the Kaskaskia rocks of Monroe and Randolph Counties, Ill. They were systematically carried on in connection with the geological work for the State of Illinois, in progress at the same time under the direction of Prof. Weller, in order to have the benefit of accurate determinations of the horizons from which the collections were made, with reference to the several subordinate formations into which the Kaskaskia of that region is divided. In this way it was hoped to correct some confusion as to the stratigraphic relation of a number of species described in the geological reports of Illinois and Iowa. The operations were successful in this respect, and at the same time six large boxes of fine specimens were obtained. Among the specimens there are a number of slabs covered with crinoids not hitherto found in that formation in an excellent state of preservation, a portion of one slab containing 22 specimens of 9 different species.

#### MOLLUSCAN FAUNA OF VIRGINIA COAST.

Mr. John B. Henderson, jr., a member of the Board of Regents of the Institution, and Dr. Bartsch, of the National Museum, visited the Atlantic shore of Accomac County, Va., which had heretofore received little attention from collectors.

The chief objects of this trip were to determine of just what elements the molluscan fauna consisted; to see how many, if any, species of southern range lapped over from Hatteras, and what northern species still persisted in this faunal area. The collectors were fortunate in their somewhat haphazard choice of a locality, for they encountered at Chincoteague a greater variety of stations than can probably be found at any other point along this section of the coast. Here there are interior sounds of very considerable extent which are very shallow (4 to 12 feet), more or less thickly sown with oyster beds and with patches of eel grass, the bottom ranging from hard sand through varying degrees of hard clay to soft mud.

They found also the unusual feature of a bight or protected cove formed by the southward drift at the southern end of Assateague Island, protected from heavy wave action by a long, curved sand spit. This bight has a soft mud bottom, with a temperature possibly 8° less than that of the open sea. The mud brought up with the dredge seemed almost icy to the touch. This condition is probably produced by cold springs seeping through the floor of the bight. This colder water of the bight yielded to their dredge *Yoldia limatula*, large and fine, and *Nucula proxima*, whereas just around the protective spit of sand, on the ocean side, they found dead *Terebras*



of two species, some young *Busycon perversa*, and a valve of *Cardium robustum*—a somewhat startling association of species.

Then there was the open sea, which here presumably differs in no manner from other open-sea stations along the 200 miles or more of this coast. The bottom drops off very gradually to the edge of the continental shelf, some 75 or 100 miles out. The open-sea stations which they occupied were, as might be expected, very poor. The smooth, hard sand bottom seemed almost barren of life, and the softer patches that were explored contained only many dead shells, mostly small bivalves. The work in the open sea was scarcely a good test, although they made probably 20 hauls, reaching out from the shore some 4 or 5 miles, but the chart soundings indicated more promising areas of pebbly bottom a few miles beyond what they considered the safety zone for a small motor boat.

The inner waters of the sound were found to be unexpectedly rich in molluscan life, the species, for the most part, not having been taken outside or in the bight.

#### EXPEDITION TO DUTCH EAST BORNEO AND CASHMERE.

In continuation of the exploration and collection carried on through the generosity of Dr. W. L. Abbott, by Mr. H. C. Raven, in Dutch East Borneo it may be said that the work is going forward with excellent results. Dr. Abbott is continuing his personal explorations in Cashmere and has forwarded some valuable specimens of mammals, including a queer little silvery gray shrew about 74 millimeters long, and a magnificent snow leopard, with its complete skeleton. In Baltistan, northwestern Cashmere, Dr. Abbott secured about 289 skins, which have been presented to the National Museum. After a sojourn in England he expected to return to Cashmere and march to Ladak. He also intended to visit Nubra and go east along the frontier to the Dipsang Plains, where he hoped to secure specimens of a certain vole from Kara Korum Pass, as well as the little Tibetan fox, known to the Cashmere furriers as the "king fox."

#### LIFE ZONES IN THE ALPS.

Aided by a small grant from the funds of the Institution, Dr. Stejneger, head curator of biology in the National Museum, visited the eastern Alps toward the close of the last fiscal year, to make further observations toward a determination of the limits of the life zones, which in that part of Europe might correspond to those established in North America. That a system of such life zones exists in Europe has long been more or less vaguely stated by authors, but although a definite correlation was established by Dr. Stejneger and Mr. Miller in 1904, certain points, especially the interrelation of

the zones corresponding to the so-called Canadian and Hudsonian life zones in America, were greatly obscured by the long-continued interference of man and animals with nature, such as the grazing of cattle in the high Alps, deforestation, and more recently, artificial reforestation.

It was thought that the eastern Alps might show more primitive conditions. Dr. Stejneger visited the mountain region between Switzerland and the head of the Adriatic. Arrived at the town of Bassano, at the foot of the Venetian Alps, he began to study the life zones of the Val Sugana and the plateau of the Sette Comuni from that point. This plateau descends abruptly to the Venetian plain on the south, while to the east and north it is separated from the mass of the eastern Alps by the Val Sugana, or the valley of the River Brenta, and on the west by the lower part of the valley of the Adige, or Etsch. It is intersected by the boundary line between Italy and Austrian Tyrol.

He made a series of excursions from Bassano, Levico, and Trento as successive headquarters, during which time he completely circled the territory, and crossed the plateau once on foot. He was able to trace the boundaries of the Austral life zones in considerable detail, as well as to gather data which connect with the previous correlation of these zones in the western Alps and with the corresponding zones in North America. It was found that the bottom of the entire Val Sugana belongs to the upper Austral zone. Owing to the rainy and inclement weather the results were less satisfactory in the higher regions, though some important data corroborating previous conclusions were obtained.

Observations were also made on the Etsch Valley in Tyrol, from Trento to Schlanders, and on its tributary, the Eisak, from Bozen to its source on the Brenner Pass.

The elaboration of the detailed observations will be incorporated with a general report on the biological reconnoissance of the western Alps.

#### RESEARCHES UNDER HARRIMAN TRUST FUND.

Dr. C. Hart Merriam continued during the year to carry on certain natural history and ethnological investigations provided for by a special trust fund established by Mrs. E. H. Harriman for that purpose. His principal work during the year was on the big bears of America, a group he has been studying for more than 20 years and concerning which he now has a monograph in preparation. In furtherance of this study, specimens have been placed at his disposal by numerous sportsmen and hunters and by the larger museums of the United States and Canada. In the course of his investigations a transcontinental line was run across the country to the coast of California by which the easternmost limits of range were determined for

a number of species of mammals, birds, reptiles, and plants. And while traversing Utah and Nevada several remote tribes of Indians were visited, particularly the Gosinte, from whom a long-needed vocabulary was obtained.

#### ANTHROPOLOGICAL RESEARCH IN EASTERN ASIA.

For the extension of researches in eastern Asia, in continuation of anthropological investigations carried on in Siberia and Mongolia under the direction of the Institution in 1912, an allotment has been made from the Smithsonian fund for work during the next fiscal year and for a limited period thereafter. The plan of operations includes a thorough study of the peoples of the eastern coast of Asia, Manchuria, Mongolia, Tibet, and Siberia, among whom it is believed lies the secret of the origin of the American Indian. Investigations thus far made by Dr. Hrdlička in behalf of the Institution indicate, he says, "that there exist to-day over large parts of eastern Siberia and in Mongolia, Tibet, and other regions in that part of the world numerous remains which now form constituent parts of more modern tribes or nations, of a more ancient population (related in origin, perhaps, with the latest paleolithic European), which were physically identical with, and in all probability gave rise to, the American Indian."

In a pamphlet on Smithsonian Explorations in 1913 a number of other biological and anthropological investigations are described.

#### RESEARCHES UNDER THE HODGKINS FUND.

The Hodgkins fund was established in 1891 by a gift of \$200,000 from Mr. Thomas George Hodgkins, of Setauket, N. Y. By subsequent gifts during his life and through sums received from Mr. Hodgkins's estate, of which the Institution was made the residuary legatee, the fund has increased to about \$250,000. It was stipulated by the donor that the income of \$100,000 of his gift should be devoted to the increase and diffusion of more exact knowledge in regard to the nature and properties of atmospheric air in connection with the welfare of man. He indicated his desire that researches be not limited to sanitary science, but that the atmosphere be considered in its widest relationship to all branches of science, referring to the experiments of Franklin in atmospheric electricity and the discovery of Paul Bert in regard to the influence of oxygen on the phenomena of vitality as germane to his foundation. To stimulate researches in these directions the Institution offered a prize of \$10,000 for a paper embodying some new and important discovery in regard to the nature and properties of atmospheric air, which was awarded in 1895 to Lord Rayleigh and Prof. William Ramsay, of London, for

the discovery of argon, a new element in the atmosphere. Another prize of \$1,000 for the best popular treatise on atmospheric air was awarded to Dr. Henry de Varigny, of Paris, from among 229 competitors in the United States, France, Germany, England, Scotland, Ireland, Italy, Russia, Austria-Hungary, Norway, Denmark, Finland, Bohemia, Bavaria, Servia, Switzerland, Spain, India, Canada, Mexico, and Argentina. Numerous investigations on the "composition of expired air and its effects upon animal life," in "atmospheric actinometry," the "air of towns," "animal resistance to disease," "experiments with ionized air," "the ratio of specific heats," and kindred topics have been carried on with the aid of grants from the Hodgkins fund. Researches have likewise been aided in connection with the temperature, pressure, radiation, and other features of the atmosphere at very high altitudes, extending during the past year to more than 45,000 feet, and many other lines of investigation have been carried on, through all of which it is believed that valuable knowledge has been acquired by which the welfare of man has been advanced.

Under a grant from the Hodgkins fund Mr. A. K. Ångström carried on some observations in California during the past year for the purpose of measuring nocturnal radiations at different altitudes ranging from below sea level to the summit of Mount Whitney, 4,420 meters (14,502 feet). Some of the results attained by Mr. Ångström and work in connection therewith are discussed by Dr. C. G. Abbot in his report as director of the Astrophysical Observatory.

A grant was also made to Mr. Ångström to enable him to measure the "nocturnal radiation"—that is, loss of heat to space during the total eclipse of the sun August 21, 1914, in the north of Sweden.

In connection with the International Congress on Tuberculosis held in the National Museum in 1908 the Institution offered a Hodgkins fund prize of \$1,500 for the best treatise on "the relation of atmospheric air to tuberculosis." About a hundred papers were submitted, and after an exhaustive examination by the advisory committee the award has now been made and the prize divided equally between Dr. Guy Hinsdale, of Hot Springs, Va., and Dr. S. Adolphus Knopf, of New York, for their essays on the topic stated.

Dr. Hinsdale's essay was recently published at the expense of the Hodgkins fund, the public demand for the work requiring the printing of a second edition. In discussing the general treatment of the disease, the essayist has special reference to the effect of the atmospheric air and the value of various climates in relation to tuberculosis. In conclusion the author says:

We believe that climate may be utilized as an adjuvant of great value for carrying out the hygienic, dietetic treatment of all forms of tuberculosis and many other diseases. \* \* \* The first place must be assigned to an abundance

of air, which is as nearly as possible bacteriologically and chemically pure.  
 \* \* \* Only at the sea or at the highest elevations do we find air really pure, but we can approximate it by living out of doors.

\* \* \* Probably the best combination is a low humidity and a moderately cool temperature; the average tuberculosis patient makes his best gains after August 1 and in subsequent cold, dry weather when such conditions prevail. \* \* \*

The old idea about equability of temperature, at least between the temperature of midday and midnight, is not of great importance; all mountainous stations show great variations in this respect. Some variability tends to stimulate the vital activities, but in older people and those who are feeble great variability is a disadvantage.

As far as altitude is concerned it probably has not, per se, any great influence; certainly, to my mind, not so much as we used to think. However, altitude is incidentally associated with mountain life or life on the plains, with more sun, less moisture, and scattered population.

\* \* \* Surgical tuberculosis is always favorably influenced by a seashore residence suitably chosen. \* \* \* Constant outdoor life in all weather works miraculous cures after the most formidable operations for bone tuberculosis, and in many cases renders them wholly unnecessary in patients whose physical condition on admission was most unpromising.

#### SMITHSONIAN TABLE AT NAPLES ZOOLOGICAL STATION.

In the interest of American biologists who may desire to study marine life under exceptionally favorable facilities, the Institution has for more than 20 years maintained a table at the Naples Zoological Station. Investigators are assigned the use of this table for stated periods on the recommendation of an advisory committee appointed for the purpose. During the past year the table has been utilized by Mr. Reynold A. Spaeth, a student of Harvard University, who pursued studies in experimental physiology; Dr. T. S. Painter, graduate of Yale University, for work on an experimental cytological problem; and Prof. Edwin C. Starks, of Stanford University, for an investigation of the bones and muscles of the mandible of fishes.

#### RESEARCH CORPORATION.

In February, 1912, the Research Corporation was organized under the laws of New York as a means for furthering scientific and technical research. Its principal object is—

to acquire inventions and patents and to make them more available in the arts and industries, while using them as a source of income, and, second, to apply all profits derived from such use to the advancement of technical and scientific investigation and experimentation through the agency of the Smithsonian Institution and such other scientific and educational institutions and societies as may be selected by the directors.

No dividends are to be paid, and the entire net profits are to be devoted to research. The Smithsonian Institution is interested in

the management of this corporation through the membership of the secretary in its board of directors, which is composed of business and professional men, many of whom have had experience in large industrial and mining enterprises, and it is provided in the certificate of incorporation that the Smithsonian Institution may receive funds for research and experimentation.

The chief assets of the corporation at present are the Cottrell patents relating to the precipitation of dust, smoke, and chemical fumes by the use of electrical currents. Dr. F. G. Cottrell, the inventor and donor of these patents, has described their operation and advantages and the progress thus far made in their installation in an article printed in the Smithsonian Report for 1913.

A number of other patents in various fields of industry have been offered by officers of the Government and scientific institutions, as well as by manufacturing corporations holding patents not available for their own purposes, and undoubtedly there are many others, both in this country and abroad, who will be glad to have their inventions utilized for the benefit of scientific research.

#### AMERICAN SCHOOL OF ARCHEOLOGY IN CHINA.

In my last report mention was made of the proposed establishment of an American school of archeology in China. The objects of the school as proposed are: (1) To prosecute archeological research in eastern China; (2) to afford opportunity and facilities for investigation to promising and exceptional students, both foreign and native, in Asiatic archeology; and (3) to preserve objects of archeological and cultural interest in museums in the countries to which they pertain in cooperation with existing organizations, such as the Société d'Ankor, etc.

The management of the affairs of the school is placed in the hands of an executive committee of five, consisting of Dr. Charles D. Walcott, Secretary of the Smithsonian Institution; Mr. Charles Henry Butler, reporter of the United States Supreme Court; Prof. E. W. Shipley, of St. Louis; Mr. Charles L. Freer, of Detroit; and Mr. Eugene Meyer, jr., of New York. The general committee consists of 16 gentlemen especially interested in archeological research in China, with Dr. Walcott as chairman and Mr. Butler as secretary. A preliminary survey in the Chinese Republic for the information of the general committee in considering the permanent organization of the proposed school has been made, and the committee will later be called together for further consultation.

#### PUBLICATIONS.

Of new publications there was issued by the Smithsonian Institution and its branches during the year a total of 6,807 printed pages,

with 834 plates of illustrations. The aggregate distribution was 202,671 copies of pamphlets and bound volumes.

One of the principal functions of the Institution, "the diffusion of knowledge," is accomplished through its publications, which record results of original researches, accounts of explorations, the progress achieved in science and industry, and general information in all branches of human knowledge believed to be of value to those interested in the promotion of science and in the welfare of man. The series of "Contributions to Knowledge" in quarto form, and the "Miscellaneous Collections," in octavo, are printed in limited editions at the expense of the Institution and distributed chiefly to certain large libraries throughout the world where they are available for public reference. The Annual Report, however, is provided for by congressional appropriations, and the edition is great enough to permit its wide distribution. Besides the official report of the Board of Regents and the secretary of the general operations of the Institution during the year, there is included in the Smithsonian Report a general appendix containing 30 or more original or selected papers illustrating the more remarkable and important developments in scientific discovery.

In addition to the three series of works above mentioned pertaining to the Institution proper, there are issued under its direction (*a*) the Annual Report, the Proceedings, and the Bulletins of the National Museum, including the Contributions from the National Herbarium; (*b*) the Annual Report and Bulletins of the Bureau of American Ethnology; and (*c*) the Annals of the Astrophysical Observatory, all of which are public documents printed through annual allotments by act of Congress.

*Smithsonian Contributions to Knowledge.*—The chief characteristic of memoirs contained in the Contributions to Knowledge is that they are discussions of extensive original investigations constituting important additions to knowledge. Since the establishment of this series in 1848 there have been published about 150 of these memoirs in 35 quarto volumes. The most recent of these, reviewed in my last report, was the "Langley Memoir on Mechanical Flight," recording the experiments of the late Secretary Langley, resulting in his successful demonstration of the practicability of aerial navigation with machines heavier than the air.

*Smithsonian Miscellaneous Collections.*—Thirty-six papers in this series were issued during the year, forming parts of seven volumes, as enumerated in Appendix 8. They included some articles by your secretary, describing further results of his studies of Cambrian fossils, and papers on the usual wide range of biological, geological, and anthropological topics. In this series are included the Smithsonian tables, which have become standard works of reference.

In 1852 the Institution published the first edition of the Smithsonian meteorological tables, which were so widely used by physicists during the next 40 years that it was decided to publish three sets of tables, independent of one another, but forming a homogenous series. The first of the new series, Smithsonian Meteorological Tables, was published in 1893; revised editions were issued in 1896, 1897, and 1907, and another revised edition is now under consideration. The second series, Smithsonian Geographical Tables, appeared in 1894, editions slightly revised were issued in 1897 and 1906, and additional copies of the last edition were printed during the past year to meet the constant demand for this work. In 1896 there was published the Smithsonian Physical Tables, which have passed through several editions, the sixth revised edition being now in press. In this latest edition are incorporated many new tables and the insertion of recent data in the older tables to conform with the great advances in various fields of physical science. A fourth series is the Smithsonian Mathematical Tables (Hyperbolic Functions), published in 1909.

*Smithsonian Report.*—The distribution of the Annual Report for 1912 was long delayed, awaiting a supply of the quality of paper used in that publication. The volume contains 38 articles of the usual character in the general appendix. The report for 1913 was in type at the close of the fiscal year. The popularity of this publication continues unabated, the entire edition each year becoming exhausted very soon after its completion.

*Special publications.*—For several years past the Institution has issued in printed form the Opinions rendered by the International Commission on Zoological Nomenclature. During the past year Opinions 57 to 65 were thus published. To aid the work of this commission the Institution also provides for clerical services in connection with the office of its secretary in this country.

Another special publication of the year, printed in a limited edition, was a pamphlet giving an account of the exercises in the Smithsonian building on May 6, 1913, on the occasion of the presentation of the Langley medal to Monsieur Eiffel and to Mr. Glenn H. Curtiss, and the unveiling of the Langley memorial tablet.

*Harriman Alaska Series.*—In 1910 there was transferred to the Smithsonian Institution by Mrs. Edward H. Harriman the remainder of the edition of volumes 1 to 5 and 8 to 13 of the elaborate publication on the results of the Harriman Alaska Expedition of 1899. It may be recalled that this expedition was organized with the cooperation of the Washington Academy of Sciences, but entirely at the expense of the late Mr. Edward H. Harriman, of New York. It was participated in by a large party of scientific specialists, on a steamship specially chartered for the purpose. A narrative of the trip and observations on the regions visited, together with descrip-



tions of the natural-history features of Alaska were prepared by specialists of the party and published in the series above mentioned. Volumes 6 and 7 on botany are still in preparation. During the past year volume 14 has been issued by the Smithsonian Institution. It is a monograph of the shallow-water starfishes of the North Pacific coast, from the Arctic Ocean to California, and is accompanied by 110 plates of illustrations.

*National Museum publications.*—The annual report for 1914 of the assistant secretary in charge of the National Museum was published during the year, together with 49 papers from the Museum Proceedings, and 9 Bulletins, including a number of parts of volumes of Contributions from the National Herbarium.

*Ethnology publications.*—The Bureau of American Ethnology issued during the year a bulletin on Chippewa Music and one on the Ethnozoology of the Tewa Indians. There were in press at the close of the year three annual reports and several bulletins, as noted in the second appendix of this report.

*Astrophysical Observatory.*—Volume 3 of the Annals of the Astrophysical Observatory was distributed early in the fiscal year.

*Reports of historical and patriotic societies.*—In accordance with the national charters of the American Historical Association and the National Society of the Daughters of the American Revolution, annual reports of those organizations were submitted to the Institution and communicated to Congress.

*Allotments for printing.*—The allotments to the Institution and its branches, under the head of "Public printing and binding," during the fiscal year, aggregating \$76,200, were all utilized, with the exception of small balances on work in progress at the close of the year. The allotments for the year ending June 30, 1915, are as follows:

For the Smithsonian Institution: For printing and binding the annual reports of the Board of Regents, with general appendices.....	\$10,000
For the annual reports of the National Museum, with general appendices, and for printing labels and blanks, and for the Bulletins and Proceedings of the National Museum, the editions of which shall not exceed 4,000 copies, and binding, in half morocco or material not more expensive, scientific books, and pamphlets presented to or acquired by the National Museum library.....	37,500
For the annual reports and Bulletins of the Bureau of American Ethnology and for miscellaneous printing and binding for the bureau....	21,000
For miscellaneous printing and binding:	
International Exchanges.....	200
International Catalogue of Scientific Literature.....	100
National Zoological Park.....	200
Astrophysical Observatory.....	200
For the annual report of the American Historical Association.....	7,000
Total.....	76,200

*Committee on printing and publication.*—The advisory committee on printing and publication under the Smithsonian Institution has continued to examine manuscripts proposed for publication by the branches of the institution and has considered various questions concerning public printing and binding. Twenty meetings of the committee were held during the year and 121 manuscripts were passed upon. The personnel of the committee during the year was as follows: Dr. Frederick W. True, Assistant Secretary of the Smithsonian Institution, chairman; Dr. C. G. Abbot, Director of the Astrophysical Observatory; Dr. Frank Baker, Superintendent of the National Zoological Park; Mr. A. Howard Clark, editor of the Smithsonian Institution, secretary of the committee; Mr. F. W. Hodge, Ethnologist-in-charge of the Bureau of American Ethnology; Dr. George P. Merrill, head curator of geology, United States National Museum; and Dr. Leonhard Stejneger, head curator of biology, United States National Museum.

*Distribution of publications.*—In accordance with the law enacted August 23, 1912, requiring that all Government publications be mailed from the Government Printing Office, the Smithsonian Report and publications of the United States National Museum and the Bureau of American Ethnology have since been distributed direct from the Government Printing Office.

#### LIBRARY.

The library of the Smithsonian Institution is its most valuable single possession. The number of publications of learned societies and of periodicals and other works pertaining to pure and applied science which have been brought together by the Institution since its organization aggregates more than half a million titles. In 1866 many of the scientific works in the library were transferred for various administrative reasons to the Library of Congress, where they form the Smithsonian deposit, which is constantly being increased by new accessions. The number of additions to the deposit during the past year was 32,195 pieces, including 20,603 periodicals, 3,765 volumes, 1,729 parts of volumes, 5,755 pamphlets, and 343 charts.

In the Smithsonian and Museum buildings there are retained such books of the Smithsonian Library as are needed for reference in scientific investigations, and there is maintained a reading room, where the current numbers of nearly 300 foreign and domestic scientific periodicals are on file for consultation by students in general and by the staff of the Institution and its branches.

In the main hall of the Smithsonian building steel stacks are being constructed for the better care and preservation of the libraries of the Government bureaus under the Institution.

Works on natural history, the arts and industries, and other subjects pertaining to the several departments of the National Museum are installed in the new and older Museum buildings. This library now numbers 43,609 volumes, 73,761 pamphlets and unbound papers, and 124 manuscripts.

In the assistant librarian's review of the year's operations in appendix 6 of this report details will be found as to the work of the library in its several subdivisions.

#### INTERNATIONAL CONGRESSES.

The Institution is frequently invited to send representatives to scientific congresses in the United States and abroad, but as funds are not available for the expenses of delegates, invitations can be accepted only in a few instances when collaborators of the Institution or members of the scientific staff are willing to attend at their own expense.

Your secretary, as a member of the Twelfth International Congress of Geology, would have attended the meeting in Toronto August 7 to 14, 1913, but he was unable to make arrangements to leave his field work in the Canadian Rockies at that time. He had an opportunity to address the members of the congress during their visit to Field, British Columbia. Dr. George P. Merrill, head curator of geology in the United States National Museum, however, attended the congress as representative of the Smithsonian Institution and the Museum.

Plans had been perfected at the close of the fiscal year for holding the Nineteenth International Congress of Americanists in Washington during the month of September, 1914.

#### GEORGE WASHINGTON MEMORIAL BUILDING.

In my last report reference was made to the act of Congress approved by the President March 4, 1913, authorizing the George Washington Memorial Association to erect a memorial building on Armory Square facing the Mall, which extends from the Capitol to the Washington Monument. The control and administration of the building, when erected, is in the Board of Regents of the Smithsonian Institution. Plans for the building were selected in May, 1914, from designs submitted by 13 competing architects, and were subsequently approved by the National Commission of Fine Arts.

The drawings depict a colonial building with pillared front and square ground plan. The main feature is an auditorium to seat 6,000 people, which is arranged in the form of an ellipse, with the stage at one end and a deep balcony encircling the whole.

The work of construction must be begun before the 4th of March, 1915, or the authorization by Congress for the use of the above site

will lapse. It is further provided that the work of construction can not be commenced until the sum of \$1,000,000 is raised by the association, and although Mrs. Henry F. Dimock, president of the association and chairman of the building committee, has secured a part of this sum, much still remains to be raised.

The cost of the building must be not less than \$2,000,000, and there must be provided for its maintenance a permanent fund of not less than \$500,000. In the preamble of the original bill (S. 5494) passed by the Senate April 15, 1912, "to provide a site for the erection of a building to be known as the George Washington Memorial Building, to serve as the gathering place and headquarters of patriotic, scientific, medical, and other organizations interested in promoting the welfare of the American people," the purpose of the building is defined as follows:

Whereas George Washington, on July 9, 1799, said, "It has been my ardent wish to see a plan devised on a liberal scale which would spread systematic ideas through all parts of this rising empire," and it was Washington's wish to materially assist in the development of his beloved country through the promotion of science, literature, and art, and with the firm conviction that "knowledge is the surest basis of public happiness"; and

Whereas the changing conditions that time has brought require new methods of accomplishing the results desired by Washington and now a necessity of the American people; and

Whereas at the present time there is not any suitable building in the city of Washington where large conventions or in which large public functions can be held, or where the permanent headquarters and records of national organizations can be administered; and

Whereas a building should be provided in which there shall be a large auditorium, halls of different sizes where all societies pertaining to the growth of our best interests can meet, and such as it is deemed desirable may have permanent headquarters; and

Whereas the George Washington Memorial Association is now engaged in obtaining funds for the erection and endowment of a building suitable for the purposes above set forth, to be known as the George Washington Memorial Building: Therefore \* \* \*

The law as passed by Congress and approved by the President March 4, 1913, was as follows:

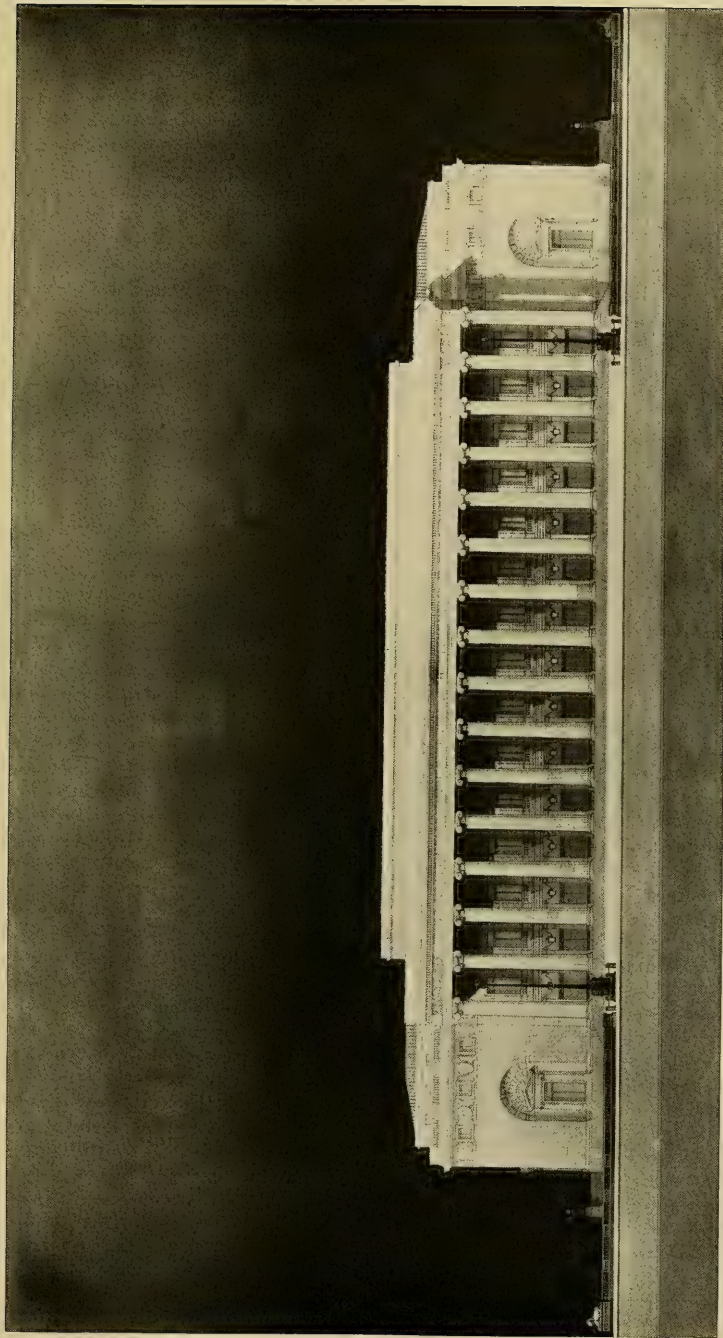
*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled:*

\* \* \* \* \*

SEC. 10. That a building is hereby authorized to be erected in the District of Columbia, to be known as the George Washington Memorial Building.

The control and administration of said building, when erected, shall be in the Board of Regents of the Smithsonian Institution.

The George Washington Memorial Association is authorized to erect said building in accordance with plans to be procured by said association and to be approved by the Commission of Fine Arts, said building to be fireproof, faced with granite, and to cost not less than \$2,000,000; it shall have an auditorium that will seat not less than six thousand people, and such other smaller halls, reception rooms, office rooms, and so forth, as may be deemed necessary to



APPROVED DESIGN FOR GEORGE WASHINGTON MEMORIAL BUILDING.



carry out the purposes for which the building is erected. And the said George Washington Memorial Association shall in addition provide a permanent endowment fund of not less than \$500,000, to be administered by the Board of Regents of the Smithsonian Institution, the income from which shall, as far as necessary, be used for the maintenance of the said building.

Permission is granted the George Washington Memorial Association to erect said building in the north end of the reservation known as Armory Square, bounded by Sixth and Seventh Streets west and B Street north and B Street south. The south front of said building is to be on a line with the south front of the new National Museum Building, in the north end of the Smithsonian Park; and the said land is hereby set apart for that purpose: *Provided*, That the actual construction of said building shall not be undertaken until the sum of \$1,000,000 shall have been subscribed and paid into the treasury of the George Washington Memorial Association: *And provided further*, That the erection of said George Washington Memorial Building be begun within a period of two years from and after the passage of this act, and this section shall be null and void should the George Washington Memorial Association fail to comply with the provisions thereof, which are conditions precedent to the authorization herein granted.

Said building may, among other purposes, be used for inaugural receptions and special public meetings authorized by Congress.

Congress may alter, amend, add to, or repeal any of the provisions of this section.

## NATIONAL MUSEUM.

Since the operations of the Museum are reviewed by Assistant Secretary Rathbun in the first appendix of this report and are discussed in detail in a separate volume, it seems unnecessary for me here to do more than to allude to some of the more important features of the year's work. The growth of the Museum during recent years has been greater than during any prior period of its history. Confined as it was for more than 30 years within restricted quarters poorly adapted for many classes of exhibits, its growth was greatly hindered and its value to the public hampered in many ways. With the completion of the new building, however, there has come an era of greater usefulness to the Nation in every direction. The natural history collections are now given adequate room in the spacious halls of the new building, while in the older structure opportunity is afforded for the proper display of objects relating to the arts and industries and to American history. Increase in every division of the three principal departments of the Museum—anthropology, biology, and geology—is now welcomed both for purposes of exhibition and in the study series.

During the last fiscal year there was added a total of 337,705 objects, 14,879 of which pertained to anthropology, 257,816 to zoology, 44,675 to botany, 3,648 to geology and mineralogy, 13,045 to paleontology, 2,930 to textiles and other animal and vegetable products, 505 to mineral technology, and 207 to the National Gallery of Art. The relative importance of many classes of objects thus acquired is

referred to in the assistant secretary's report. Among the most noteworthy accessions in ethnology were more than 500 objects from Dutch New Guinea, the Moluccas and Ambon of the Ceram group, collected and presented by Dr. W. L. Abbott, who has done so much for the Museum in past years toward increasing our knowledge of the zoology and ethnology of the Far East. Among the important acquisitions in biology were some 200,000 insects obtained by entomologists of the Department of Agriculture during economic investigations; a generous donation from Dr. E. A. Mearns, consisting of his large private collection of bird skins, eggs, and skeletons, containing many rarities; and over 10,000 specimens, mainly grasses, from the Department of Agriculture. Additions in geology and mineralogy included a 200-pound specimen of copper from Nevada; many specimens of minerals from various sources, including rare and excellent examples and some new forms; meteorites; Cambrian fossils; and three valuable type collections pertaining to the paleobotany of Alaska and other regions. Dr. E. O. Ulrich presented about 3,000 Paleozoic fossils of much value to the Museum. The division of textiles has been enriched by many important accessions and has been much extended in its scope during the year.

In the division of history there were large additions to memorials of eminent Americans and of historic events. An exhibit of period costumes installed in one of the history halls has attracted much attention. It includes a series of costumes worn by wives of many of the Presidents of the United States, and contains valuable examples of the styles of dress in America since the colonial period and a variety of articles of domestic and personal use. A unique photographic exhibit illustrates the apparatus and results of all stages of that art since the first attempts to obtain pictures through the agency of the sun.

The collection of fine arts has been enriched by further gifts from Mr. Charles L. Freer, of Detroit. His original gift, made in 1906, contained about 2,300 objects, and has since been increased to 4,701 most interesting and valuable examples of oriental and American art. The collection remains in the possession of the donor during his life. Mr. Freer has provided for the construction of a suitable building adjacent to the National Museum for the permanent preservation and display of the collection. Among permanent additions to the National Gallery were a number of paintings. The loans aggregated 109 paintings and 3 pieces of sculpture from various sources.

I have elsewhere mentioned the bequest to the Institution by Dr. Chamberlain of \$35,000, establishing a fund to promote the increase and scientific value of the Isaac Lea collections of precious stones and fresh-water mussels in the Museum.



In the interest of general education, particularly in natural history, it has been the custom for many years to distribute to schools and colleges throughout the country such duplicate material as can be spared from the Museum collections. During the past year 14,564 specimens were thus distributed, besides several hundred pounds of rocks, minerals, and ores.

The total attendance of visitors to the new or natural history building during the year was 267,728 for week days and 61,653 on Sundays, while the older building was visited by 146,533 persons.

The publications of the year numbered 14 volumes and 58 separate papers. The library has now increased to a total of 43,609 volumes and 73,765 pamphlets and other unbound papers.

The auditorium and other available rooms in the new building have proved of great convenience for meetings of scientific bodies and were largely utilized during the year. Accommodations were also afforded for several conventions of agriculturists, accompanied by exhibits of wool, fruits, and other products.

#### BUREAU OF AMERICAN ETHNOLOGY.

The work of the Bureau of American Ethnology during the year has brought together much new material relating to the habits and customs and the languages of the American Indians. The results of the studies of the several investigators are being published as promptly as practicable. The systematic researches by the ethnologists forming the scientific staff of the bureau are described in detail in the second appendix of this report. I may mention as of special interest a reconnoissance by Mr. F. W. Hodge, Ethnologist-in-charge, of a group of prehistoric ruins on a mesa in Cebollita Valley, N. Mex. These ruins consist of a number of house groups forming a compound built on an almost impregnable height, and designed for defense; not only the groups but the individual houses have the form of fortifications, while the vulnerable point of the mesa rim is protected by means of a rude breastwork of stones. The outer wall, which protects the whole mesa, is built of exceptionally fine masonry, probably the finest work to be found in ancient pueblo ruins of the Southwest. The building stones have been dressed to shape, matched for size, and their faces finished by pecking, with such labor as to confirm the belief that this ancient village was designed for permanent occupancy. Among the special features of interest which Mr. Hodge discovered were a burial cist in which skeletons, pottery, and the remains of a mat were found; three small cliff lodges situated in the sides of the cliffs; several ceremonial rooms or kivas associated with the ruined houses; and the remains of the early reservoirs of the inhabitants.

A study was made by Dr. Fewkes of prehistoric antiquities in the Lesser Antilles and material gathered for a proposed monograph on the aborigines of those islands. Examination was made of many village sites, prehistoric mounds, shell heaps, and boulders bearing incised pictographs. In a shell heap in Trinidad there was found a valuable collection of animal heads made of terra cotta and stone and other implements illustrating the early culture of the island. As a result of his researches thus far, Dr. Fewkes concludes that—

The New World, when discovered, had not advanced in autochthonous development beyond the neolithic age, whereas in Asia, Europe, and Africa a neolithic age was supplemented by one in which metals had replaced stone for implements. In the Old World this polished-stone epoch was preceded by a paleolithic stone age not represented, so far as is known, in America. The ethnology and archeology of our Indians is therefore only a chapter, and that a brief one, of a segment of a much more extended racial evolution, as illustrated in Asia, Europe, and Africa.

Further study was made by Mr. Mooney of the sacred formulas of the Cherokee Indians in North Carolina. In connection with this work a collection of medicinal plants was made, including some specimens of the native corn still cultivated as sacred and found to be a new and hitherto undescribed variety of special food importance under cultivation.

Investigations also progressed among the Fox Indians, the Creeks, Osage, Seneca, and other tribes, and in the study of various Indian languages and ceremonies much advancement was made. Toward a work on the habits and customs and ceremonies of the Tewa Indians of New Mexico there has been brought together much interesting information.

Several years ago there was begun a series of handbooks on the American Indians. The first of these was issued in two volumes, entitled "Handbook of American Indians North of Mexico," and contains a descriptive list of the stocks, confederacies, tribes, tribal divisions, and settlements north of Mexico, with sketches of their history, archeology, manners, arts, customs, and institutions. The work proved of so great value to the public that several reprintings became necessary, including a special reprint by the Canadian Government.

The Handbook of American Indian Languages forms the second of the series. Part I of this handbook has been published and portions of the second part have been printed in separate form. This work discusses the characteristics and classification of the languages of the American Indians and their relation to ethnology. In North America north of Mexico there are distinguished 55 linguistic families. The first volume of the handbook contains sketches of a number of the languages of the northern portion of the continent, in-

cluding the Athapascan, Tlingit, Haida, Chinook, Algonquian, Siouan, and Eskimo.

The third of the series of handbooks is in preparation. This will be a Handbook of American Antiquities. Work is also in progress on a Handbook of Aboriginal Remains East of the Mississippi, and it is proposed later to put in hand a series of handbooks of the Indians of the several States.

Publications issued during the year included a bulletin on Chipewa Music and one on the Ethnozoology of the Tewa Indians; those in press at the close of the year were the Twenty-ninth, Thirtieth, and Thirty-first Annual Reports, besides four bulletins. There was distributed a total of 12,819 volumes or separate papers. The library of the bureau now numbers about 20,000 books, 13,000 pamphlets, and several thousand unbound periodicals. For the proper care of the library, steel bookstacks have been installed in the large hall on the first floor of the Smithsonian building.

#### INTERNATIONAL EXCHANGES.

Soon after the organization of the Institution there was created what is known as the International Exchange Service for the interchange of publications between the scientific and literary societies in the United States and other parts of the world. The mutual advantages of this system to all countries concerned has been reviewed from time to time, and I will not attempt to state them again here. During the past year there was handled by this service a total of 341,667 packages weighing 566,985 pounds. The weight of outgoing material was 424,481 pounds, and of incoming 142,504 pounds. Fifty-six sets of official publications of the United States Government are sent abroad in exchange with other Governments and form about half of the total weight of shipments, although the receipts from that source are comparatively small. In appendix 3 will be found details of the general operations of the Exchange Service including a list of foreign bureaus or agencies through which exchanges are transmitted.

#### NATIONAL ZOOLOGICAL PARK.

In establishing the National Zoological Park in 1890, "for the advancement of science and the instruction and recreation of the people," Congress placed its administration in the Board of Regents of the Smithsonian Institution. The collection in the park is the outgrowth of a small number of living animals which for several years had been assembled in very crowded quarters near the Smithsonian building mainly for the purposes of scientific study. Chiefly through gifts and exchanges the size of the park collection has grad-

ually increased, until it now numbers 340 species of mammals, birds, and reptiles represented by 1,362 individuals.

Among the 325 accessions during the year I may mention as of special interest a male hippopotamus, a pair of young Bengal tigers, a pair of young lions, a sable antelope, and an American white crane. Among some specimens received from the Zoological Garden at Giza, Egypt, was a pair of young African elephants. Thirty-eight individual donors contributed birds, reptiles, and other animals.

Popular interest in the park is shown by the fact that the number of visitors during the year was 733,277, or a daily average of 2,009, being an increase of 100,000 over the previous year. In the interest of education in nature study many schools, classes, etc., visit the park accompanied by their teachers; such groups during the year numbered 3,172 individuals.

The improvements in quarters for the animals and for the comfort of visitors are reviewed by the superintendent in Appendix 4. Ten breeding pens, in a yard 40 by 56 feet, were built to provide for the breeding and study of mink in cooperation with the Department of Agriculture.

The rough stone or bowlder bridge across Rock Creek, appropriation for which was made during the previous fiscal year, was opened to travel on November 1, 1913.

Perhaps the most important feature of the year in connection with the Zoological Park was an appropriation by Congress which became available for the purchase of about 10 acres to extend the western boundary of the park to Connecticut Avenue, between Cathedral Avenue and Klinge Road. Legal proceedings necessary to the transfer of this property had not been completed at the close of the year.

A new roadway to the park has been made to replace Quarry Road, which had a very steep and dangerous gradient.

Among the important needs, some of which have been urged in former reports, are (*a*) a suitable house for the care and preservation of the birds of the collection; (*b*) an adequate reptile house; (*c*) a pachyderm house; and (*d*) a hospital and laboratory. Attention is called to the statements of the superintendent urging these several needs, particularly with regard to the laboratory.

There is need, too, for extending the scope of classes of animals in the park, particularly those of common interest to the public, such as the gorilla, orang, and chimpanzee, giraffe, East African buffalo, and mountain goats and sheep.

#### ASTROPHYSICAL OBSERVATORY.

The work of the Astrophysical Observatory, described in detail in the report of its director, has comprised observations and computations at Washington and in the field relating to the quantity of

solar radiation, its variability from day to day, and the effect of the atmospheric water vapor in absorbing the radiations of great wave length such as are emitted toward space by the earth. Much attention has been given to the design, construction, and testing of new apparatus for these researches, including apparatus for measuring the sky radiation, special recording pyrliometers to be attached to free balloons for the purpose of measuring solar radiation at great altitudes, and a tower telescope at the Mount Wilson Station.

The principal results of the year include: A new determination of the number of molecules per cubic centimeter of gas, depending on measurements at Mount Wilson of the transparency of the atmosphere; successful measurements by balloon pyrliometers of the intensity of solar radiation up to nearly 45,000 feet elevation above sea level. The results tend to confirm the adopted value of the solar constant of radiation. Most important of all, the investigation by the tower telescope at Mount Wilson shows that the distribution of radiation along the diameter of the sun's disk varies from day to day and from year to year. These variations are closely correlated with the variations of the total amount of the sun's radiation. Thus the work of the year yields an independent proof of the variability of the sun and tends to elucidate its nature.

### INTERNATIONAL CATALOGUE OF SCIENTIFIC LITERATURE.

The United States Bureau of the International Catalogue is administered by the Smithsonian Institution through a small annual appropriation by Congress. It is one of 33 regional bureaus in various countries engaged in the collecting, indexing, and classifying of scientific publications of the year, and the classified references are forwarded to the central bureau in London, where they are collated and published in a series of 17 annual volumes covering each branch of science and aggregating about 8,000 printed pages. These volumes are sold at an annual subscription price of \$85, chiefly to large reference libraries and important scientific institutions, the proceeds covering in part the cost of publication. During the past year there was forwarded to London from the United States bureau a total of 28,606 reference cards, making a total of 318,936 cards prepared in the United States since the system was organized in 1901.

### NECROLOGY.

Augustus Octavius Bacon was born in Bryan County, Ga., October 20, 1839, and died in Washington City February 14, 1914. He became a member of the Board of Regents in 1905 and for three

years had served on the executive committee. Mr. Bacon was educated at the University of Georgia in 1859 and was honored with the degree of doctor of laws in 1909. He was for many years engaged in law practice at Macon, Ga. He became a United States Senator on March 4, 1895, and was thrice reelected, serving on many important committees of that body. As a Regent of the Smithsonian Institution he took deep interest in the development of plans for the advancement of science and the general welfare of mankind.

Irvin St. Clare Pepper, born in Davis County, Iowa, June 10, 1876, became a member of the Board of Regents of the Smithsonian Institution in December, 1911, and was reappointed December 10, 1913. He died on December 22, 1913. Mr. Pepper graduated from the Southern Iowa Normal School in 1897 and received the degree of bachelor of laws from the George Washington University in 1905, and in 1906 entered law practice at Muscatine, Iowa. He was county attorney from 1906 to 1910 and member of the Sixty-second and Sixty-third Congresses. Resolutions to the memory of Mr. Pepper were adopted by the Regents at the adjourned annual meeting January 15, 1914.

Frederick William True, born at Middletown, Conn., July 8, 1858, died in Washington City June 25, 1914. He was appointed an Assistant Secretary of the Smithsonian Institution June 11, 1911, his special duties being in connection with the library and international exchanges. Dr. True had held various positions of trust under the Institution since 1881. The following tribute to his memory was adopted by his associates at a meeting on June 26, 1914:

Frederick William True, master of science, doctor of laws, Assistant Secretary of the Smithsonian Institution, died at Washington, D. C., June 25, 1914, in the fifty-sixth year of his age.

His associates in the Smithsonian Institution and its several branches, assembled at a meeting in his memory at the United States National Museum on June 26, do here record their profound sorrow in the loss of an honored scholar, an executive officer of marked ability, a sincere friend, a patriotic citizen, and a modest man.

Graduated from the New York University at the early age of 20, he at once entered the service of the United States as the youngest member of the scientific corps brought together by Profs. G. Brown Goode and Spencer F. Baird during the formative stages of the National Museum. Through faithful performance of duty in positions of trust he leaves to his associates an example worthy of emulation, and through his unassuming and upright personality a cherished memory.

Respectfully submitted.

CHARLES D. WALCOTT, *Secretary.*

## APPENDIX 1.

### REPORT ON THE UNITED STATES NATIONAL MUSEUM.

SIR: I have the honor to submit the following report on the operations of the United States National Museum for the fiscal year ending June 30, 1914:

#### INTRODUCTORY.

The last report contains a brief review of the exhibits in the new building, which mainly relate to zoology, geology, and anthropology, though also including the paintings of the National Gallery of Art and certain special and temporary installations. The natural history collections, while presenting a generally finished appearance, are, however, as there explained, still incomplete and to a large extent provisional in their arrangement. Considerable progress toward their improvement was made during last year, and this work will be continued as rapidly as possible until, to the extent of the material available, some degree of perfection has been reached, but the purposes of the Museum would be poorly served if more or less, and even radical, changes were not made from time to time in those parts of the collections which belong especially to the public.

Because of extensive interior alterations going on in the Smithsonian building, it was necessary temporarily to withdraw the graphic arts collection from display, but upon the completion of this work the surroundings for this important division will be greatly improved. In the older Museum building, moreover, there was much activity in connection with the exhibits, though not as much was accomplished as was desirable or would have been possible with a slightly increased appropriation. This building has been entirely given over to the arts and industries and American history. Square in shape, its exhibition space, amounting to about 100,000 square feet, is divided into four naves or halls, radiating from a central pavilion, the naves in turn being connected by ranges, eight in number, which follow the outer walls of the building and inclose four square covered courts. Although consisting of only a single story, except in the towers and pavilions, which are used for offices, most of the halls are supplemented by galleries. The building faces north, and its different subdivisions are designated by their position with

reference to the rotunda. In planning for the distribution of the collections it has not been found possible to provide for all of the subjects which should be comprehended, and the fact that a few of the halls are still unarranged is due in part to the insufficient force and in part to the length of time required for the preparation of many of the exhibits. A brief summary of the conditions at the close of the year may, however, be of some interest.

The division of history, formerly limited to the north hall, has been extended into the west north range and the north west range, and also occupies the floor space in the northwest court. The hall and connecting range contain the general collection of history, consisting chiefly of memorials. The collection of musical instruments previously filling the large wall cases along the sides of this hall, though not belonging to this division, have been removed to a corresponding position in the northwest court, leaving these cases to be used for historical furniture, of which the Museum has many important pieces. In one of them, however, "The Star-Spangled Banner" still remains, pending arrangements for a better installation. In the north west range has been placed the period costume collection, which was first opened to the public in February last. This noteworthy feature, which centers upon a series of White House costumes draped on manikins, contains many and valuable examples of the styles of dress in America from the colonial period to the present time, besides a great variety of articles of domestic and personal use. In the adjoining or northwest court are the coins and medals and the postage stamps, also an installation of last year. The former are shown in table cases, but the stamps required a special arrangement which has been carried out in the form of two long upright cases, fitted with framed sliding screens to which the stamps are attached. The gallery of this court is devoted to the unique photographic exhibit, illustrating by apparatus and results all of the stages in the progress of this art from the first attempts at obtaining pictures through the agency of the sun. The opening of this display was likewise a feature of the year.

On the left-hand side of the building on entering is the art textile collection in the east north range, followed by the boat hall, or north east range, in both of which but few changes were made. The division of mechanical technology, to which the exhibit of boats belongs, also occupies the east hall, the northeast court, and about one-half of the south east range. The court is mainly given over to small arms, both military and other, of which the collection is the largest and most varied in this country. The remaining space is used for a considerable variety of subjects, such as land and air transportation, electricity in its several applications, measures of space and time, and many miscellaneous devices and inventions, which are well



displayed and labeled and to which numerous additions have recently been made. In the gallery of the court are the collections of ceramics, glass-ware, bronzes, etc., and in the north gallery of the hall is the exhibit of the division of medicine.

The southern part of the building has been allotted to two divisions, which, organized some 30 years ago but soon discontinued on account of lack of space, have recently been reestablished on a broader basis and have already attained considerable prominence. One of these is the division of textiles, including also such animal and vegetable products as do not specifically belong elsewhere. To this division have been assigned the south hall, the east south range, and the southeast court, together with a considerable amount of gallery space. While much of the original collection, when removed from storage, was found to be still serviceable, the greater part of the textile display, which is exceedingly rich and varied in its representation of this industry in the United States, is the accumulation of only two years. There is also a fair illustration of the work done in the Philippines and some examples from Porto Rico. The exhibition of animal and vegetable products is much less advanced, and there is still to be taken up the subjects of commercial woods and of foods.

The division of mechanical technology has been assigned the west hall, the south west and west south ranges, and the southwest court, the occupation of all of which has been planned, in part definitely, in part provisionally. The objects of this division are to illustrate the processes involved in extracting minerals from the earth, and in the utilization of the products so obtained, with the intention of covering all the important minerals, both metallic and nonmetallic. Progress with this exhibition will be slow, because of the time required to build models, in which the mining and manufacturing interests are giving hearty and generous support, even to the extent of furnishing expensive reproductions of their works and operations. The first of the exhibits, opened to the public last year, relate mainly to the subject of coal, and include several excellent models, the largest of which, representing a bituminous colliery, occupies fully half the floor space of the southwest court. A number of other models and exhibits were also completed and installed, and additional ones were in course of construction.

#### COLLECTIONS.

The additions to the collections aggregated approximately 337,705 specimens, apportioned among the several branches of the Museum as follows, namely: Anthropology, 14,879; zoology, 257,816, of which over 214,000 were insects; botany, 44,675; geology and mineralogy, 3,648; paleontology, 13,045; textiles and other animal and vegetable

products, 2,930; mineral technology, 505; and the National Gallery of Art, 207. There were also received as loans 2,280 objects, mainly for the exhibition series in ethnology, archeology, history, and the Gallery of Art.

The most noteworthy accessions in ethnology consisted of over 500 objects from northern Dutch New Guinea, the Moluccas and Ambon of the Ceram group, collected and presented by Dr. W. L. Abbott; an especially important lot of material obtained at St. Lawrence Island, Alaska, by Dr. Riley D. Moore, of the Museum staff; and a series of Siouan ethnologica of particular value, as the locality and tribal origin of the specimens are properly recorded. The principal additions in American archeology comprised material from old Indian camp sites and caves in Patagonia and from Guatemala, the results of explorations by Mr. Chester W. Washburne in the former region, and by Mr. Neil M. Judd in the latter; an interesting series of stone implements from Jackson County, Mo., presented by Mr. J. G. Braecklein; and a large number of exceptionally fine specimens of the same character from Missouri and Illinois, purchased from Mr. D. I. Bushnell, jr. The collection of Old World archeology was enriched by a drawing in color of an ancient mosaic map of Palestine and adjacent regions, the gift of Mr. S. W. Woodward; an important contribution from the Egypt Exploration Fund through Mr. Woodward; a large number of ancient coins and other objects from the Near East, lent by Mrs. John Paul Tyler; and several series of prehistoric material from Europe. The more notable accessions in physical anthropology consisted of human crania and skeletons, mainly of the Eskimo and Aleuts, the Buriats of central Siberia, the Mongolians, the natives of Mělnik, Bohemia, the Patagonians, and early man in Europe. The division of mechanical technology received a circular sundial adapted to the latitude of Peking and inscribed in Chinese characters from Mr. Claude L. Woolley; a set of ancient German coin scales made by Johann Daniel Ellinghaus, in Radevormwalde, Germany; important additions to the series of firearms, and many other objects. There were a number of interesting contributions in pottery and bronze, and also several desirable gifts to the collections of graphic arts and musical instruments.

The division of history was the recipient of many accessions, some of which were of much value, and an exceptionally large percentage were permanent acquisitions. There were additions to the Washington collection; pieces of furniture formerly belonging to Alexander Hamilton and Gen. Philip Schuyler; relics of Rear Admiral Charles Wilkes, United States Navy; of Aaron Burr, and of Prof. Spencer F. Baird; the sword carried by Brig. Gen. Strong Vincent, United States Volunteers, when mortally wounded at Little Round Top, Gettysburg; and a large collection of canes, interesting historically

as well as for their workmanship, some having been owned by persons of high distinction. The collection of postage stamps, postal cards, and stamped envelopes was increased to the extent of about 9,000 examples, and many additions were made to the series of coins and medals and of portrait photographs. So many contributions were received for the period costume collection as to permit of the installation and opening of the hall allotted to this subject.

Especially notable among the acquisitions in biology were some 200,000 insects obtained by entomologists of the Department of Agriculture during economic investigations in Texas and neighboring States. Mr. H. C. Raven, whose work has continued to be maintained by Dr. W. L. Abbott, sent over 1,500 mammals and birds from eastern Borneo, including numerous rare and probably some new forms. Besides extensive collections of fishes and marine invertebrates, the Bureau of Fisheries transferred a large number of reptiles and batrachians from various parts of North America, and the first series, with the types, of the mammals obtained in Lower California during the cruise of the steamer *Albatross* in 1911. The Biological Survey, in addition to its regular deposits of North American mammals and birds, turned over to the Museum many mammals from Patagonia and reptiles and batrachians from Panama, and Prof. A. M. Reese contributed a large quantity of specimens of several groups collected by him at the Philippine Islands. Additional mammals were received from China, Africa, the island of Sardinia, etc., and reptiles and batrachians from California, Mississippi, Alabama, and other southern States. A generous donation from Dr. E. A. Mearns, United States Army, retired, consisted of his large private collection of bird skins, eggs, and skeletons, containing many rarities. Other sources of fishes than those above referred to were Japan, Fanning Island, the Philippines, Panama, and California; and of insects, the Bahama Islands, Florida, the southwestern and western States, and Alaska, besides which important series in several groups of insects of economic importance were among the contributions. The division of mollusks received as gifts the important collection of the late Prof. F. W. Bryant, of Lakeside, Cal.; about 2,000 specimens obtained by Mr. John B. Henderson, jr., during a dredging expedition to the vicinity of Chincoteague, Va., and many other valuable donations. The marine invertebrates from the Bureau of Fisheries consisted chiefly of material in several groups which had been the subject of study and report. About 100 species of rotifers, mounted on slides, were presented by Mr. H. K. Harring, and numerous more or less important collections were received from various sources. The additions to the herbarium comprised over 10,000 specimens, mainly of grasses, from the Department of Agriculture, resulting from recent field work; about 3,500 West Indian and African plants from the New

York Botanical Garden; nearly 1,600 Chinese plants from the collection of Mr. E. H. Wilson; about 10,000 specimens of cryptogams collected by the late John B. Leiberger and presented by Mrs. Leiberger; and important contributions from Venezuela, Guam, the Philippines, and the southern and southwestern States.

Among the additions in geology and mineralogy were an important series of rocks and ores from the Sudbury nickel region and the Cobalt mining district of Canada; a suite of recently described minerals from Peru; a 200-pound specimen of copper from Nevada; an unusual deposit of carnotite in a fossil tree trunk; a large piece of quartz vein, containing an abundant development of blade-like crystals of tungsten ore; and many specimens of minerals from various sources, including rare and excellent examples and some new forms. The collections of meteorites and building stones received many desirable additions, and the Geological Survey deposited a number of series of rocks, of petrological value, from different parts of this country and from Hawaii. The accessions in invertebrate paleontology included about 150 types of Cambrian fossils collected and described by Secretary Walcott; some 5,000 specimens from the Middle Cambrian of British Columbia, also collected by him; and about 150 type specimens of Bryozoa and Ostracoda, representing work of the curator of the division on the Silurian collections from the island of Anticosti, preserved at Yale University. The Geological Survey transferred several collections, some of which had been described; Dr. E. O. Ulrich presented about 3,000 Paleozoic fossils, of much value to the Museum; and an important series of Tertiary mollusks and Ordovician graptolites was received in exchange from Australia. The most important acquisitions in vertebrate paleontology consisted of a large collection made by Mr. Charles W. Gilmore in the Blackfeet Indian Reservation; of the results of further explorations by Mr. James W. Gidley in the Pleistocene cave deposits near Cumberland, Md.; and of cetacean remains collected in the Miocene beds near Chesapeake Beach, Md., by Mr. William Palmer and Mr. Norman H. Boss. The section of paleobotany was enriched by three valuable type collections from the Geological Survey, representing the Jurassic formation at Cape Lisburne, Alaska; the Tuscaloosa formation of Alabama; and the Cretaceous and Tertiary in South Carolina and Georgia.

The number and value of the accessions in the division of textiles were greatly increased over those of the previous year, due to the appreciation shown by the producers in the important work which the Museum has undertaken. Only a brief summary can here be given of the many contributions which were almost wholly in the form of gifts. To the cotton collection were added fancy wash dress goods and shirtings, comprising pleasing and artistic combina-

tions of plain, ratine, and mercerized cotton yarns, with spun silk and viscose silk in plain and fancy weaves; plain, piece-dyed and yarn-dyed dress goods of all cotton and cotton and artificial silk; cotton fabrics finished to imitate those of silk and of wool and fancy printed cotton velvets in gold and silver effects for millinery purposes. The collection of wool and woolen products was enriched by a large assortment of new fleeces of the best American and foreign wools, all carefully graded and labeled to show the value in the grease and when scoured; specimens marking the steps in the manufacture of both woolen and worsted goods, and many pieces of finished fabrics of both classes. The already extensive silk collection was enlarged by the addition of a commercial package of skeins of the finest Japanese raw silk, many yards of printed broad silks representing the latest seasonable designs, brocaded novelty silks for dress trimmings, and samples of ties, scarfs, veilings, and ribbons of all kinds. Another important acquisition was the oldest model of the Grant silk reel, now in universal use for winding silk into standardized crossed skeins. The manufacture of fur felt hats from the finest grades of beaver, nutria, hare, and coney furs was illustrated by a comprehensive collection showing each step in the process from the fur pelt to the finished hat, and including the leather and silk trimmings for the principal types of hats. The development of an artist's plan for the decoration of a fabric by weaving or printing was represented by a series of preliminary sketches, weaver's drafts, and engraved plates for use on the pantograph machine, all bearing on the technology of design.

In the division of mineral technology, including a few of the exhibits presented at the St. Louis exposition of 1904, which had not previously been unpacked and recorded, the principal accessions of the year were as follows: A very full illustration of the processes of glass making; a complete working model of a bituminous colliery at Fairmont, W. Va., covering a space of 30 by 40 feet; a reproduction of a bituminous mine at Willock, Pa., 8 by 12 feet square, which excellently supplements the former; a relief panel illustrating processes involved in the manufacture of illuminating gas, tar, ammonia, and other coal products in what is known as the by-products coke industry; a number of photographic enlargements depicting typical underground operations incidental to coal mining; a series of native gypsum and gypsum products; and a collection illustrating crude mica and its industrial products.

#### NATIONAL GALLERY OF ART.

The most important acquisition consisted of the formal transfer to the Institution, by Mr. Charles L. Freer, of Detroit, Mich., of 198 objects as additions to his munificent gift to the Nation, comprising the

material which he had assembled since the last previous transfer in November, 1912. This collection, as will be recalled, relates wholly to American and oriental art, and is to remain in the possession of the donor during his life. The original gift, made in 1906, contained approximately 2,326 objects, but through subsequent contributions this number has been increased to 4,701, of which 983 are examples of American art and 3,718 are examples of oriental art. These may be summarized as follows:

In the American section James McNeill Whistler is represented by 62 oil paintings, 44 water colors, 32 pastels, and 798 drawings, etchings, lithographs, etc., besides 1 album of sketches, 38 original copper plates, and the entire decoration of the famous Peacock Room. The remainder of this section is composed of 75 oil paintings, 6 water colors, 25 pastels, and 1 silver point, illustrating the work of 9 other American painters, namely, Thomas Wilmer Dewing, Childe Hassam, Winslow Homer, J. Gari Melchers, John Singer Sargent, Joseph Lindon Smith, Abbott Handerson Thayer, Dwight William Tryon, and John Henry Twachtman. The oriental paintings comprise 826 screens, panels, kakemono, and makimono from Japan and China; 32 albums of paintings and sketches from the same countries; and 13 paintings from Tibet. Of oriental pottery there are 1,665 pieces, mainly from Japan, China, Corea, central and western Asia, and Egypt; of bronzes, 236 pieces, of which over 200 came from China; of stone objects, including sculptures, 234 pieces, mainly Chinese; of wood carvings, 17 pieces; and of lacquered objects, 31 pieces. The collection also contains over 600 pieces of ancient Egyptian glass in the form of bottles, vases, and various other shapes, besides a large number of miscellaneous objects from both the Far and Near East.

Other permanent additions to the Gallery consisted of 3 paintings by Miss Clara Taggart MacChesney, Guy C. Wiggins, and Addison T. Millar, respectively, contributed by Mr. William T. Evans, of New York; a painting by Du Bois Fenelon Hasbrouck, presented by Mr. Frederic Fairchild Sherman in memory of his wife; and 4 paintings by Walter Shirlaw and a portrait sketch of him by Frank Duveneck, received as a gift from Mrs. Shirlaw.

The loans to the Gallery aggregated 109 paintings and 3 pieces of sculpture from 12 sources. Eighty-one of the paintings were received for 2 special exhibitions, the first comprising 25 portraits in oil from the National Association of Portrait Painters, the other consisting of 56 marine paintings by Mr. William F. Halsall, of Boston.

#### MISCELLANEOUS.

It is gratifying to announce a bequest by the late Rev. Dr. Leander Trowbridge Chamberlain, an honorary associate of the Museum, of the sum of \$35,000, to be known as the Frances Lea Chamberlain

fund, the income of which is to be used for promoting the increase and the scientific value and usefulness of the two important Isaac Lea collections, \$25,000 being given on account of the gems and precious stones and \$10,000 on account of the fresh-water mussels or Unionidæ. Owing to delay in the settlement of the will, payment had not been made to the Institution at the close of the year.

By the will of Miss Lucy Hunter Baird, daughter of Prof. Spencer F. Baird, the second Secretary of the Smithsonian Institution, the Museum received during the year many interesting objects for its collections and several hundred important books for its library.

The distribution of duplicate material suitable for teaching purposes to schools and colleges in all parts of the country aggregated 14,564 specimens, besides several hundred pounds of rock and mineral fragments for blowpipe analysis. These were sent out in 148 separate sets, and consisted mainly of rocks, minerals, ores, fossils, and mollusks and other marine invertebrates. In exchange transactions with other establishments and with individuals over 15,000 duplicates were used, about 80 per cent of this number being plants. The loans to specialists for study comprised 10,256 specimens of animals and plants, and 5,425 specimens from the department of geology, besides 746 unassorted lots of marine invertebrates and 107 lots of fossils.

The total attendance of visitors at the new building aggregated 267,728 for week days and 61,653 for Sundays, making the daily average for the former 855 and for the latter 1,185. The number who visited the older Museum building was 146,533, a daily average of 486, and the Smithsonian building 102,645, a daily average of 328. The falling off in attendance at these two buildings may be ascribed to the fact that many of the halls in the former, emptied by the withdrawal of the natural history collections, have not yet received their new installations, and extensive rearrangements and repairs in the Smithsonian building practically caused the closing of its exhibition rooms for a considerable part of the year.

The publications of the year numbered 14 volumes and 58 separate papers, 49 of the latter belonging to the series of Proceedings and 9 to the Contributions from the National Herbarium. In addition, 31 short papers on materials in the collections of the Museum, relating mainly to new discoveries, were printed in the Smithsonian Miscellaneous Collections. The total distribution of Museum publications amounted to about 93,200 copies.

The library received 1,917 volumes, 1,723 pamphlets, and 132 parts of volumes, and its total contents were thereby increased to 43,609 volumes and 73,765 pamphlets and other unbound papers, the greater part of which have been obtained through exchange and as gifts. Good progress was made in the reorganization and arrangement of

the section of the library relating to the arts and industries, which occupies the former library quarters in the older Museum building.

The auditorium and other rooms in the new building were frequently used for meetings and public gatherings having objects akin to those of the Institution, and also by several bureaus of the Government for official purposes. The regular meetings of the Washington Society of the Fine Arts and the Anthropological Society of Washington were held here, as were the public sessions of the annual meeting of the National Academy of Sciences and the meetings of the Spanish-American Atheneum and the American Ornithologists' Union. Lectures were delivered under the auspices of the Washington Academy of Sciences, the Medical Society of the District of Columbia, the Washington Society of Engineers, the George Washington University, the Washington Society of the Archaeological Institute of America, the Germanistic Society of Washington, the Columbia Chapter of the Daughters of the American Revolution, the District of Columbia Chapter of the Guild of American Organists and other musical societies, and the Home Club of the Department of the Interior. A special program of American music was also rendered by the Friday Morning Music Club. Of three congresses, one held in Chicago, the others in Washington, each had a special meeting in the auditorium for addresses by distinguished persons. These were the Third International Congress of Refrigeration, the fourth annual meeting of the American Association for Study and Prevention of Infant Mortality, and the Third International Congress on the Welfare of the Child. On April 18, 1914, a reception to the Daughters of the American Revolution was given by the Secretary of the Institution.

The accommodations afforded by the new building were utilized on numerous occasions by bureaus of the Department of Agriculture for meetings, conferences, and hearings, including a series of lectures under the Bureau of Plant Industry and a conference with the wool-growers, accompanied by an excellent exhibition of wool specimens, which has been deposited in the Museum. A meeting of the American Pomological Society in conjunction with the Eastern Fruit Growers Association, the Northern Nut Growers Association, and the Society for Horticultural Science, held in November, 1913, brought together in the foyer of the building one of the finest exhibitions of fruit that has ever been displayed in this country.

Respectfully submitted.

RICHARD RATHBUN,

*Assistant Secretary in Charge U. S. National Museum.*

Dr. CHARLES D. WALCOTT,

*Secretary of the Smithsonian Institution.*

OCTOBER 6, 1914.



## APPENDIX 2.

### REPORT ON THE BUREAU OF AMERICAN ETHNOLOGY.

SIR: In response to your communication dated July 1, I have the honor to present the following report on the operations of the Bureau of American Ethnology for the fiscal year ending June 30, 1914, conducted in accordance with authority granted by the act of Congress approved June 23, 1913, making appropriations for the sundry civil expenses of the Government, and with a plan of operations submitted by the ethnologist-in-charge and approved by the Secretary of the Smithsonian Institution. The provision of the act authorizing the researches of the Bureau of American Ethnology is as follows:

American ethnology: For continuing ethnological researches among the American Indians and the natives of Hawaii, including the excavation and preservation of archæologic remains, under the direction of the Smithsonian Institution, including salaries or compensation of all necessary employees and the purchase of necessary books and periodicals, including payment in advance for subscriptions, \$42,000.

#### SYSTEMATIC RESEARCHES.

The systematic researches were conducted by the regular staff of the bureau, consisting of nine ethnologists, including the ethnologist-in-charge and several special investigators. These operations may be summarized as follows:

Mr. F. W. Hodge, ethnologist-in-charge, was occupied during most of the year with the administrative affairs of the bureau. Considerable attention, however, was devoted to the preparation of the annotated bibliography of the Pueblo Indians, which is probably more extensive than that of any other group of tribes, as Pueblo written history commenced in the year 1539, and the writings pertaining thereto are exceedingly voluminous. The bibliography is recorded on cards, the number of which is now about 1,900. The cataloguing of the vast amount of manuscript material bearing on the subject has been somewhat simplified by the recent publication of Bolton's Guide to Materials for the History of the United States in the Principal Archives of Mexico, published by the Carnegie Institution of Washington, and Twitchell's Spanish Archives of New Mexico, although without consultation of the documents themselves it is not possible to give more than the title in most cases. In the

spring Mr. Hodge made a brief visit to the library of the Presbyterian Board of Home Missions in New York City, where he was enabled to record the titles of numerous published writings on missionary efforts among the Pueblo Indians of New Mexico, not accessible elsewhere. In this bibliographical work he has had the assistance of Mrs. Frances S. Nichols and Miss Florence M. Poast. Mr. Hodge continued to represent the bureau on the Smithsonian Advisory Committee on Printing and Publication, and the Smithsonian Institution on the United States Board on Geographic Names.

Early in the autumn of 1913 Mr. Hodge made a reconnoissance of a group of ruins, evidently prehistoric, on a mesa rising from the southwestern margin of the Cebollita Valley, about 20 miles south of Grant, Valencia County, N. Mex., and only a few yards from the great lava flow that has spread over the valley to the westward for many miles. While no very definite information regarding the origin of this ruined pueblo has yet been obtained, there is reason to suppose that it was occupied by ancestors of the Tanyi, or Calabash, clan of the Acoma tribe, and is possibly the one known to them at Kowina.

These ruins consist of a number of house groups forming a compound. That the structures were designed for defense is evident, for not only are they situated on an almost impregnable height rising about 200 feet above the valley, but the houses themselves partake of the form of fortifications, while the only vulnerable point of the mesa is protected at the rim by means of a rude breastwork of stones. Moreover, the outer walls of the buildings, some of which still stand to a height of several feet, are pierced only with loopholes, entrance to the structures doubtless having been gained by means of portable ladders, as in some of the pueblos of to-day. The houses of the great compound, consisting of four compact groups of buildings, were evidently "terraced" on the plaza side, the rooms facing this court perhaps having been only a single story in height. As a further protection to the pueblo, the eastern side was defended by a low wall, pierced by three gatewaylike openings, extending from the northeastern to the southeastern corner of the compound.

The rooms indicated in the ground plan of the four house groups number approximately 95 (for the northern group), 58 (eastern group), 32 (central group), and 102 (southeastern group), or an aggregate of 287 rooms. At the time of its occupancy the number of rooms in the compound probably approximated 550. In addition, there are traces of four or five single-story rooms abutting on the defensive wall bounding the northeastern part of the compound. A short distance from the southwestern angle of the southwestern house group are two smaller detached houses, the southernmost one consisting of 24 rooms in a long tier, 2 rooms deep, extending approximately NNW. and SSE. The other structure, about 55 feet north-

westward, is rectangular and contains 11 rooms in its ground plan. Four kivas are traceable among the rooms of the main compound—one in the northwestern, one in the central, and two in the southwestern group. In each case, so far as is determinable without excavation, the outer walls of the kivas are rectangular, while the inner walls are circular and slightly recessed a short distance above the floor.

About 500 feet southeastward from the main compound, at the edge of the mesa, stand the well-preserved walls of another structure, consisting of a double row of rooms, the outer wall, or that overlooking the mesa rim, extending 28 and 15 feet, respectively, beyond the northwestern and southwestern corners of the building proper, in order to give further protection. The length of this outer wall from angle to angle is about 132 feet. It exhibits one of the finest examples of masonry to be seen in the ancient pueblo ruins of the Southwest, for not only have the building stones been dressed to shape, but their faces have been finished by pecking, with such labor as to confirm the belief that the ancient village was designed for permanent occupancy. The southern corner of the outer defensive wall is not only curved, but the stones of which it is built are rounded by careful pecking, a most unusual feature in pueblo architecture. That this last structure was designed to protect the most vulnerable part of the mesa is evident from the fact that the outer wall is without openings of any kind and extends beyond the rooms of the structure, and because the adjacent mesa rim is protected by a rude low wall, especially at such points as required ready defense against attack from below. As already noted, the walls of these ruins are noteworthy by reason of the excellence of their masonry, special effort having been made to produce a pleasing effect in the exterior faces. Of the inner walls so much can not be said; but as there is no question that when the houses were occupied the rooms were smoothly plastered, there was little need of the elaborate finish accorded the exposed masonry. Slight attention was paid either to regularity in the shape of the stones or to smoothness of surface in building the inner walls, nor was the aboriginal mason more particular in bonding the inner and outer courses than in "breaking" the joints of the outer face. It seems remarkable that, possessed of such patience and expertness as the builders here display in other ways, they seem to have been unaware of the necessity of avoiding the construction of their walls in such manner that in places as many as six or seven vertical joints occur practically in line. In this brief report only mere mention can be made of many other interesting architectural features of these ruins, as well as of another pueblo ruin, more or less circular in shape, situated a few miles northeastward on a low mesa at the extreme head of Cebollita Valley, which here forms a small but beautiful canyon.

The inhabitants of the great compound first described obtained their water supply by means of two principal reservoirs fed by the drainage from the great sandstone shelf on the southern slope of the mesa summit. These reservoirs are natural depressions in the rock, but the capacity of the larger one, which measures 35 by 90 feet and is about 5 feet in maximum depth, has been greatly augmented on the western side by an artificial retaining wall 14 feet long and 10 feet in thickness, with an exposed face of 2½ feet on the reservoir side. So well did this reservoir evidently serve the ancient mesa-dwellers, that, during seasons of unusual rain, water still stands to a considerable depth within the depression. The smaller reservoir is triangular in outline and measures about 15 by 19 feet. An interesting feature in connection with the larger reservoir is the remains of a rude dike extending 60 feet along the rocky shelf above referred to, built for the purpose of diverting the flow of rain water from its natural course into the reservoir.

It is not yet known where the ancients of this pueblo customarily buried their dead, but probably the interments were made in the talus of the mesa, as is the case with the Hopi, of Arizona, to-day. There was found, however, in the corner of a shallow cavern in the northern face of the mesa, above the talus, a small cist, formed by a low and broken wall of masonry, which contained the somewhat incomplete skeletons of two adult females, one incomplete skeleton of a boy, and the incomplete and defective skeletons of two infants. With one exception these remains had been greatly disturbed by rats, which had burrowed their way through the bones and their accompaniments to the bottom of the cist and fairly filled the repository with cactus spines, excreta, and other débris of nest building. The remains were accompanied with several pottery vessels, chiefly bowls, one of which was covered with a well-preserved mat, plaited of a fibrous plant which Mr. Lyster H. Dewey, of the Department of Agriculture, identifies as a scirpus, and almost certainly *Scirpus validus*. The ornamentation of this pottery, as well as of the numerous sherds scattered about the ruins, consists of plain red, black on red, white on red, plain black, black on white, brown on white, brown on red, and many other combinations of color. All the decorations noted were in geometrical designs.

On the northern face of the mesa, but practically hidden from view except from one point in the valley below, is a small house shelter of excellent masonry, built beneath an overhanging ledge of the cliff which forms the roof. This shelter, which is provided with a single small opening overlooking the valley to the northward, was seemingly designed as a lookout station either for watching the crops or an approaching foe. Across the valley, on the eastern side of the first great mesa directly opposite that on which the ruins are

situated, is another small cliff lodge, now accessible only by artificial means. Examination of the interior, as in the case of the cliff lodge above described, yielded nothing of interest. Farther up the valley, on the northern side, in plain view near the base of a mesa, is a larger cliff lodge, filled to a considerable depth with detritus from the soft stone forming the roof and side walls. Examination of the floor of this lodge a few years ago by Mr. Hodge yielded a few corncobs, one or two small objects made of yucca leaves, and a wooden drumstick of a form such as the Zuñi now employ.

Dr. J. Walter Fewkes, ethnologist, spent the month of July, 1913, in the office continuing the preparation of his monographic report on the aborigines of the West Indies, especially describing the many objects from these islands in the noteworthy collection of George G. Heye, esq., of New York. He made a visit to New York toward the close of the month to study recent additions to this collection and to supervise the preparation of the illustrations for his report. It became necessary, in order to make this memoir as comprehensive as possible, to investigate types of the Guesde collection, now owned by the Museum für Völkerkunde in Berlin. Accordingly Dr. Fewkes went to Europe at his personal expense and spent August, September, and October studying these types and also many undescribed Porto Rican and other West Indian objects in various museums. Drawings of about 140 specimens, many of which have not been described, were made during the course of these studies in Berlin. He also visited the museum at Copenhagen, Denmark, which contains many old specimens from the Danish West Indies and some rare types of prehistoric objects from Porto Rico, all of which were either drawn or photographed. West Indian objects were found also in the museum collections of Leipzig, Dresden, and Vienna. Some time was given to an examination of the dolmens and megaliths in the neighborhood of Berlin and elsewhere in northern Germany, and of the numerous mounds and prehistoric workshops on the island of Rügen in the Baltic Sea.

Dr. Fewkes spent his vacation on the shore of the Mediterranean, which he crossed, visiting the most striking ruins in Egypt, penetrating as far south as Assouan, and making special studies of the remaining evidences of neolithic man at Abydos and El Kab on the banks of the Nile. He had always in mind a study of prehistoric irrigation in this region, with a view to comparing the works with similar remains in Arizona. In the museums at Cairo and Assouan Dr. Fewkes examined considerable material dating back to late neolithic times and found a remarkable similarity not only in architectural features but also in stone implements, basketry, bone implements, and other artifacts from the valley of the Nile and those from our Southwest. One of the important features of the visit to Egypt

was a study of methods of excavation and repair of ruins adopted by Egyptologists. On his return from Egypt Dr. Fewkes passed through Greece and southern Italy and was able to acquaint himself with the method of excavation and repair of ancient ruins in these countries, especially those on the Acropolis and at Pompeii.

Dr. Fewkes arrived in Washington in April and immediately resumed work on his report on the Aborigines of the West Indies, which was continued during April and the greater part of May. In the latter month he again took the field and spent the whole of June in archeological research in the Mimbres Valley, N. Mex. In this work he was able to enlarge our knowledge of the distribution of pottery symbols and to add important collections to the National Museum. The Mimbres Valley is practically the northern extension into the United States of an inland basin known in Chihuahua as the Sierra Madre Plateau. The fact that its drainage does not connect with any stream that flows into the Atlantic or the Pacific Ocean imparts a peculiar character to its geographical environment. On the southern part of this plateau, as along the Casas Grandes River, mounds and ruins of large size are well known, from which have been taken some of the finest pottery in the Southwest; but the archeology of the extension of this plateau into New Mexico has never been adequately examined. In his brief reconnoissance Dr. Fewkes collected evidence that the prehistoric culture of the Mimbres Valley was strikingly characteristic. The decorated pottery from the ruins in this valley is unlike that of any other region. It consists mainly of mortuary food bowls, which the prehistoric inhabitants were accustomed to break or "kill" and place over the heads of the deceased, who were buried beneath the floors of the houses. About 60 specimens of beautiful pottery, more than half of which are ornamented with painted figures of human beings and animals, were found or purchased. As these are the first examples ever brought to the National Museum from this region, the results are gratifying. They afford through their geometrical ornamentation, and especially because of the life forms which predominate, an interesting insight into the ancient culture of the Pueblo region to the north and in the Gila Valley to the west. It is Mexican in type, and some of the fragments are practically identical in form and ornamentation with the beautiful pottery from Casas Grandes, Chihuahua.

During the year Dr. Fewkes added about 350 pages of manuscript to his report on the Aborigines of the West Indies, which was approaching completion at the close of the year.

Shortly before the close of the preceding fiscal year Mr. James Mooney, ethnologist, proceeded to the reservation of the East Cherokee Indians in western North Carolina for the purpose of continuing the translation and elucidation of the large body of sacred formulas,

written in the Cherokee language and alphabet, which he had obtained from the native priests and their surviving relatives some years ago, and about one-third of which he had already translated, with explanatory notes. In connection with this work a large number of plants noted in the formulas as of medicinal or other value were collected and transferred to the division of botany of the National Museum for scientific identification. In this collection were several specimens of the native corn of the Cherokee, still cultivated as sacred by a few of the old conservatives. On examination by the experts of the Department of Agriculture this corn was found to be a new and hitherto undescribed variety of special food importance under cultivation. Return was made from the field early in October, 1913.

In June, 1914, a brief trip was made into Prince Georges and Charles Counties, Md., for the purpose of investigating the status and origin of some persons of supposedly Indian descent, concerning whom several inquiries had come to the bureau. Mr. Mooney found, as he had supposed, that these people, numbering in all several hundred, were, like the Pamunkey of Virginia and the so-called Croatan of North Carolina, a blend of the three races, Indian, Negro, and White, with the Indian blood probably predominating. They constitute and hold themselves a separate caste, distinct from both white and negro. They probably represent the mongrelized descendants of the Piscataway tribe, and are sometimes locally distinguished among themselves as "We-Sort," that is, "Our Sort."

On June 22, 1914, Mr. Mooney again started for the East Cherokee to continue work on the sacred formulas, with a view to speedy publication.

His time in the office during the winter and spring was occupied chiefly with the extended investigation of former Indian population, together with routine correspondence and replies to letters of inquiry. On request of the Department of Justice he prepared an extended deposition on tribal ranges and Indian depredations in northern Mexico and along the Rio Grande, which was officially characterized as one of the most important and interesting that had ever come before the department.

In pursuance of his investigations of the Creek Indians and allied tribes, Dr. John R. Swanton, ethnologist, proceeded to Oklahoma early in July to attend the busk ceremonies, and was present at those of the Eufaula, Hilibi, Fish Pond, and Tukabachi Creeks. Notes were taken on all of these and photographs obtained of various features of all but the last. At the same time, with the valued assistance of Mr. G. W. Grayson, of Eufaula, Dr. Swanton gathered further ethnological information from some of the old people, and continued this work after the ceremonies ceased. Somewhat later

he visited the small body of Indians in Seminole County who still retain a speaking knowledge of Hitchiti, and added about 40 pages of text to that previously obtained, besides correcting a portion of Gatschet's Hitchiti vocabulary. He made an arrangement with an interpreter by which 100 pages of additional text were received after his return to Washington.

While some time was devoted to studies of the Alabama, Hitchiti, and Choctaw languages, most of Dr. Swanton's attention while in the office during the year was centered on two particular undertakings. One of these was the proof reading of the Choctaw-English section of Byington's Choctaw Dictionary, and the compilation, with the efficient help of Miss M. C. Rollins, of an English-Choctaw index, which will comprise about 350 printed pages, to accompany it. The other was work on the first draft of an extended report on the Creek confederacy, of which the historical part, consisting of 300 typewritten pages, is practically completed.

At the beginning of the year Mr. J. N. B. Hewitt, ethnologist, undertook the work of editing and copying the Seneca text "Shagowenotha, or The Spirit of the Tides," which was recorded by him in the form of field notes in 1896 on the Cattaraugus Reservation, New York. This particular piece of work, forming a text of 3,692 native words, was completed in August, 1913. The task of making a literal, almost an etymological, interlinear translation of this text was next undertaken and was completed in November, yielding an aggregate of 11,411 English words in the rendering. The other of the two native texts in Seneca, "Doadanegen and Hotkwisdadegena," which was recorded in the form of field notes by Mr. Hewitt in 1896, was next edited and copied; this work was completed by the close of December and consists of 4,888 native Seneca words. The literal interlinear translation of this text then taken up was completed in February, 1914, making 14,664 English words in the rendering.

On finishing these translations Mr. Hewitt commenced the reading and digesting of the Seneca material of the late Jeremiah Curtin for the purpose of providing notes and explanations to the stories, a task that was made the more difficult by the fact that Mr. Curtin's field notes of explanation and identification are not available. One of the longest of the stories collected by Mr. Curtin, "Doonogaes and Tsodiqgwadon," comprising 149 typewritten pages, required 144 notes varying in length from three or four lines to several pages; but this story is of exceptional length. The entire Curtin material has now been reread and annotated. Mr. Hewitt also completed the notes for his introduction to the "Seneca Myths and Fiction," and the final writing was almost finished by the close of the year.



As opportunity offered, Mr. Hewitt continued to work on a sketch of the Iroquois language, and he has now in hand about 75 pages of manuscript, in addition to a considerable body of notes and diagrams for incorporation into final form.

Mr. Hewitt also made a week's study of the voluminous manuscript "Dictionary of Words that have been Made Known in or Introduced into English from the Indians of North, Central, and South America," compiled by the late William R. Gerard, with a view of ascertaining its value for publication by the bureau. This examination was made difficult by the fact that the compiler of the dictionary had access to many works which were not available for Mr. Hewitt.

Unfortunately the work summarized above was often interrupted, owing to the need of frequently calling on Mr. Hewitt for the preparation of data for replies to correspondents, whose inquiries pertained to linguistic, historical, sociological, and technical matters. In connection with this work there were prepared 110 letters, rarely exceeding a page in length, although some occupied several pages and required considerable study and research in gathering the needed data for reply.

During the year Mr. Francis La Flesche, ethnologist, recorded the rituals and accompanying songs of five additional Osage ceremonies, known as Wáwatho<sup>n</sup>, Wadóka Weko, Wazhi<sup>n</sup>gao, Zhi<sup>n</sup>gázhi<sup>n</sup>ga Zhazhe Thadse, and Wéxthexthe. Of these the Wáwatho<sup>n</sup> is complete; the record fills about 150 pages, including songs, diagrams, and illustrations. This ceremony, which is of religious significance and is revered by all the people, has been obsolete for about 20 years, and there now remain only two men in the tribe who remember it in most of its details. It was a peace ceremony that held an important place in the great tribal rites of the Osage, for through its influence friendly relations were maintained among the various gentes composing the tribe, and it was also the means by which friendship with interrelated tribes was established and preserved. Early French travelers mention this ceremony as being performed by the Osage in one of the tribes of the Illinois confederacy during the second decade of the eighteenth century. Unlike the Osage war ceremonies, which are complex and composed of several steps or degrees, the Wáwatho<sup>n</sup> is simple and complete in itself. The "pipes," sometimes called calumets, which are employed in its performance, consist of a number of sacred symbolic articles, each of which, with its attendant ritual, was in the keeping of a certain gens of the tribe. The assembling of these articles formed an essential part of the ceremony, for it was on this occasion that the ritual, which explained both the significance of and the precepts conveyed by the sacred articles, had to be recited. This Wáwatho<sup>n</sup> ceremony resembled that

of the Omaha, Ponca, Oto, and Pawnee tribes, differing only in minor details. To the intelligent thinking class the aims and purposes of the ceremony are clear, but there are among the Osage, as among other tribes, those who can not comprehend fully the deeper, broader teachings of such a rite, and because of this restricted view superstitious beliefs regarding it now prevail among the lower classes.

The record of the Wadóka Weko, one of the seven war ceremonies, consists of 89 pages of manuscript, with 32 songs. This rite, which is the sixth degree of the war ceremony, is divided into eight parts, exclusive of the introductory rites, and consists of rituals and songs pertaining to the ceremonial cutting of the scalps for distribution among the various gentes for their sacred packs. One of these parts has to do with the *odó<sup>n</sup>*, or "honors," won by the warriors in battle. While this ceremony is recorded completely, it is not yet ready for publication, since it is one of seven interdependent degrees the study of which is not yet finished.

Wazhi<sup>n</sup>gao, the bird ceremony for boys, is another of the seven degrees, and is regarded as important. It has been transcribed in full, but the notes thereon have not yet been elaborated for publication.

Zhi<sup>n</sup>gázhiga Zhazhe Thadse (naming of a child), a ceremony that bears no direct relation to any other, is regarded as essential to the proper rearing of a child, and is still practiced. This ceremony has been recorded in its entirety, but still lacks the descriptive annotation necessary before publication.

The Wéxthexthe, or tattooing ceremony, the last of the five recorded by Mr. La Flesche, was taken down from its recitation by one of the men who had participated therein. This transcription is still, in a measure, fragmentary, but enough has been obtained to render a fair idea of the significance of the tattoo designs employed. The notes on the Wéxthexthe are not yet prepared for publication, as there is still a possibility of recording the ceremony in its entirety. A set of the implements used by the Osage in tattooing have been obtained for illustration and have been deposited in the National Museum. There has also been placed in the museum a waxóbetó<sup>n</sup>ga, or great sacred pack, which once belonged to Waçéto<sup>n</sup>zhiga, a prominent man of the tribe, who died in 1910. After much persuasion his widow reluctantly consented to part with this sacred article, together with its buffalo-hair and rush-mat cases. This pack consists of the skin and plumage of a white pelican, the bird which in Osage mythology revealed through a dream the mysteries of tattooing and provided the implements therefor.

All the above-described ceremonies studied by Mr. La Flesche have still a strong hold on the Osage people; this, together with the fact

that every initiated person acquired his knowledge at great expense, has made it almost impossible to record the ceremonies in full from those who have been induced to speak about them.

Mrs. M. C. Stevenson, ethnologist, continued her studies of the ethnology of the Tewa Indians of New Mexico, devoting special attention to the pueblo of San Ildefonso, with a view of elaborating her memoir on this group of tribes, which consists of about 400 pages of manuscript, material relating to almost every phase of Tewa customs and beliefs having been added in whole or in part during the course of the year. Perhaps the most important of the new data gathered by Mrs. Stevenson on these interesting sedentary people relate to their ceremonies with respect to human sacrifice. The conservatism of the Tewa and the secrecy with which most of their numerous rites are conducted make them a difficult subject of study and one requiring considerable time. Mrs. Stevenson's memoir had reached such a stage of completion that at the close of the year she was making final arrangements for acquiring the materials still needed for illustrations.

Shortly after the beginning of the fiscal year Dr. Truman Michelson, ethnologist, proceeded to Tama, Iowa, to renew his researches among the Fox Indians. After successfully commencing these studies he proceeded to Tongue River Reservation in Montana for the purpose of studying the remnant of the Sutaio tribe incorporated with the Cheyenne. It seems that some ethnological information can still be obtained in regard to specific Sutaio matters, but little of the language remains. Dr. Michelson compiled a fairly large Sutaio vocabulary, but fewer than a dozen words are fundamentally different from the corresponding Cheyenne terms. Such grammatical forms as could be obtained indicate that Sutaio sheds little or no light on the divergent Algonquian type of the Cheyenne language.

Returning to Tama to renew his Fox studies, Dr. Michelson succeeded in elucidating the social organization almost to completeness. It appears that the two major divisions of the tribe are not purely for rivalry in athletics, but rather are ceremonial. Dr. Michelson was successful also in obtaining the very long myths of the culture hero and the Mother of all the Earth. It is evident that the actual Fox society still corresponds in a measure to that given in the myths.

In October Dr. Michelson proceeded to Kansas to investigate the Sauk and Fox of the Missouri. A reconnoissance only was made here, and some of the Fox material obtained at Tama was translated. In November he returned to Washington, and in January, 1914, visited the Carlisle Indian School for the purpose of studying special points of grammar and phonetics with some of the Sauk and Fox pupils. Thence he made a trip to New York City, taking with him one of the pupils for the purpose of consulting Dr. Franz Boas, hon-

orary philologist of the bureau, on certain mooted points pertaining to the Fox language. While in New York a few tracings were made with the Rousselot apparatus.

In May Dr. Michelson again visited Carlisle for the purpose of making a translation of the story of a sacred bundle of the Fox Indians, which he has recently procured.

Toward the end of the fiscal year Dr. Michelson devoted some time to the problem whether the Yurok and Wiyot languages of California were Algonquian, as had been recently claimed, and reached the conclusion that the existing evidence does not justify such a classification.

Work on the Handbook of American Indian Languages was continued under the personal direction and editorship of Dr. Franz Boas, honorary philologist. Part 2, which is in preparation, is to contain grammatical sketches of the Takelma, Coos, Siuslaw, and Alsea languages of Oregon; the Kutenai, of Montana; and the Chukchee. The Takelma sketch was published in advance in separate form in 1912. During the present year the printing of the sketch of the Coos, by Leo J. Frachtenberg, which forms pages 297-429 of part 2, was finished. The manuscript of the Siuslaw, also by Dr. Frachtenberg, was completed and revised, and, except for a small part, is in galley form. The Chukchee sketch likewise has been set up in galleys and revised, and new material on the dialects of the language, having become available, has been added. The printing of the sketch proceeded necessarily slowly, since the notes had to be read by the author, Mr. Waldemar Bogoras, who lives in Russia. A full treatment of this grammar is particularly desirable, since it serves to define the relationships of the American languages toward the west. Dr. Frachtenberg, a fuller report of whose work will follow, has made progress with his studies of the Alsea. The grammatical material and the texts have been extracted and studied, and the latter, which are to form the basis of the sketch, have been copied for the printer. Dr. A. F. Chamberlain, a valued collaborator, whose untimely death we lament, furnished a sketch of the Kutenai language. It was necessary to make a detailed study of this sketch. This was done by Dr. Boas partly during the winter in New York with the help of a Kutenai boy and partly during the month of June among the Indians of Montana and British Columbia. The report on this sketch was completed. A certain amount of preparatory work for the sketch of the Salish language was also done, more particularly a map showing the distribution of the Salish dialect, based on researches by James Teit, was completed. The expense of the field work for this map, which has occupied four years, was met by Mr. Homer E. Sargent, of Chicago, to whose lively interest in the Handbook and related subjects we are deeply indebted. The vocabularies on which the map is based are in an advanced stage of preparation.

Much time was devoted by Dr. Boas during the year to the preparation of a report on the mythology of the Tsimshian Indians, based on material written during a period of 10 years by Henry W. Tate, himself a Tsimshian. Owing to his recent death it was necessary to close the collection, the expenses of which have been defrayed from private sources. The monograph was completed and is in type for publication in the thirty-first annual report.

Brief reference to the researches of Dr. Leo J. Frachtenberg, ethnologist, has been made in connection with the preparation of part 2 of the Handbook of American Indian Languages. The beginning of the fiscal year found Dr. Frachtenberg in the field in Oregon, where, from June to September he was engaged in linguistic and ethnologic work on the Kalapooian family. During these months he collected a number of grammatical notes and nine texts in the dialect of the so-called Calapooia Proper, but owing to lack of sufficient means for continuing this field work he was compelled to discontinue it in October. The linguistic researches into the Kalapooian family brought out a number of interesting points, of which the most salient are as follows: Phonetically the family is related closely to the Lutamian (Klamath) and Sahaptin groups. Certain pronominal forms and a few numerical terms are identical with the Klamath and Sahaptin forms. In all other respects, chiefly morphological, Kalapooian bears close resemblance to the Coos, Siuslaw, and Yakonan stocks. A particularly close affiliation exists between this and the Coos family in the phonetic structure of words. While the phonetics of both languages are divergent, both are what may be termed vocalic languages and are practically free from any difficult consonantic clusters. The Calapooia texts thus far obtained deal chiefly with the Coyote cycle and are identical with myths found among the Coos, Molala, Klamath, Maidu, Chinook, Alsea, Takelma, Salish, and other tribes of the Pacific area. The mythology as a whole is typical of that region in the absence of true creation myths and in the multitude of transformation stories.

A survey of the linguistic phase of the Kalapooian stock shows it to embrace the following dialects: Calapooia Proper (also called Marysville), Chelamela, Yamhill, Atfalati, Wapato Lake, Ahantsayuk, Santiam, Lakmayut, and Yonkallat. These dialects show certain degrees of interrelationship, which may be formulated as follows: Calapooia, Santiam, Lakmayut, and Ahantsayuk form one closely related group; another group embraces the Yamhill and Atfalati dialects, while Yonkallat seems to constitute a group of its own. No information as to the Chelamela dialect could be obtained.

In July Dr. Frachtenberg received what seemed to be trustworthy information that some Willapa Indians were still living at Bay Center, Wash., but on visiting that point he found the reputed Willapa

to be in fact members of the Chehalis tribe, thus proving conclusively that the Willapa are entirely extinct.

Dr. Frachtenberg returned to New York late in October and was engaged until the beginning of December in the preparation of the Siuslaw grammatical sketch for the Handbook of American Indian Languages, additional work on which became necessary because of the fact that during his stay in the field he had received further information concerning this extinct stock. In December Dr. Frachtenberg took up his duties in Washington, becoming first engaged in supplying references from the Siuslaw texts in the grammatical sketch of that language. At the close of the year this sketch was in type. Dr. Frachtenberg also prepared for publication a Siuslaw-English and English-Siuslaw vocabulary, containing 90 typewritten pages. He furthermore prepared an English-Coos glossary, which may be utilized in the near future, as it has been found desirable to add such a glossary to each volume of native texts.

On completion of this work Dr. Frachtenberg commenced the preparation of the Alsea texts collected by Dr. Livingston Farrand in 1900 and by himself in 1910. These texts, consisting of 31 myths, tales, and narratives, and comprising 195 typewritten pages, will be submitted in the near future with a view to publication as a bulletin of the bureau.

At the close of the fiscal year Dr. Frachtenberg was preparing for another field season in Oregon, with the view of finishing his studies of the Kalapooian stock and of conducting similar researches among the Quileute.

Mr. W. H. Holmes, of the National Museum, continued his work on the preparation of the Handbook of American Antiquities for the bureau, reaching the practical completion of part 1 and making much headway in the preparation of part 2; progress in this work, however, was necessarily delayed owing to the pressure of many duties connected with a head curatorship in the National Museum.

During August, 1913, Mr. Holmes made a visit to Luray, Va., for the further study of an ancient village site near that place and the examination of certain implement-making sites in the vicinity. In June he visited Missouri for the purpose of studying certain collections owned in St. Louis and for the reexamination of an ancient iron and paint mine at Leslie. It was found, however, that recent mining operations had been carried so far that traces of the aboriginal work at the mine were practically obliterated, and besides the mine was found to be filled with water, making effective examination impossible. From St. Louis he proceeded to Chicago, where studies were made of certain collections with a view of obtaining data necessary to the completeness of the Handbook of American Antiquities.

In her studies of Indian music Miss Frances Densmore made two trips to the Standing Rock Reservation, S. Dak. (one in July and August, 1913, and one in June, 1914), where she engaged in investigations at Bullhead, McLaughlin, and the vicinity of the Martin Kenel School. This research completed the field work for the proposed volume of Sioux music, the material for which, subsequently prepared for publication, consists of 323 pages of manuscript, 98 musical transcriptions of songs, 20 technical analyses of songs, and 33 original illustrations.

The practical use which musical composers are making of the results of Miss Densmore's studies is very gratifying. Mr. Carl Busch has adapted for orchestral purposes four of the songs rendered by Miss Densmore and published by the bureau, as follows: (1) Chippewa Vision, (2) Farewell to the Warriors, (3) Love Song, (4) Lullaby. Mr. Heinrich Hammer, of Washington, has composed a Sun Dance Rhapsody and a Chippewa Rhapsody. Mr. Charles Wakefield Cadman has composed, for the voice, two of the Chippewa songs, "From the Long Room of the Sea" and "Ho, Ye Warriors on the Warpath." Mr. S. N. Penfield has harmonized two vocal quartets, "Manitou Listens to Me" and "Why Should I be Jealous?" For the violin Mr. Alfred Manger has prepared a "Fantasie on Sioux Themes," and Mr. Alberto Bimboni has well advanced toward completion an opera bearing the title "The Maiden's Leap." Certain of the orchestral arrangements have been played by the Chicago Symphony Orchestra (formerly known as the Thomas Orchestra), as well as by the symphony orchestras of Washington, Minneapolis, and Kansas City. It is interesting to note the demand for Sioux themes in advance of their publication. These have been furnished in manuscript as far as possible to those desiring them for specific and legitimate use. Two of the compositions in the foregoing list are based on such themes.

Work on the volume of Sioux music is approaching completion. This will be larger than either of the bulletins on Chippewa music, and, while the same general plan has been followed, there will be much that is new, both in subject matter and in style of illustration.

During the year work on the Handbook of Aboriginal Remains East of the Mississippi was continued by Mr. D. I. Bushnell, jr., under a small allotment from the bureau, and approximately 90,300 words of manuscript were recorded on cards geographically arranged. The entire amount of manuscript now completed is about 321,000 words, and the bibliography thus far includes 306 titles. As a result of the notes received from the Wisconsin Archeological Society, through the courtesy of its secretary, Mr. Charles E. Brown, of Madison, every county of that State will be well represented in the Handbook. It is to be regretted that more information regard-

ing aboriginal remains is not forthcoming from certain other parts of the country east of the Mississippi, especially the New England States, which at this writing are not adequately represented. The bureau is indebted to Mr. Warren K. Moorehead, of the department of archeology of Phillips Academy, Andover, Mass., for the generous use of original data gathered by him in Maine in advance of its publication by the academy.

Mr. James Murie, as opportunity offered and the limitations of a small allotment made by the bureau for these studies allowed, continued his observations on the ceremonial organization and rites of the Pawnee tribe, of which he is a member. The product of Mr. Murie's investigation of the year, which was practically finished but not received in manuscript form at the close of June, is a circumstantial account of "The Going After the Mother Cedar Tree by the Bear Society," an important ceremony which has been performed only by the Skidi band during the last decade.

In the last annual report attention was directed to a proposed series of handbooks of the Indians of the several States and to the arrangements that had been made for such a volume, devoted to the tribes of California, by Dr. A. L. Kroeber, of the University of California. The author has submitted sections of the manuscript of this work for suggestion, and, although his university duties have delayed its completion, there is every reason to believe that when the material is finished and published it will form an excellent model for the entire series. It has been hoped that the pecuniary means necessary for the preparation of these State handbooks would be provided in accordance with the estimate of an appropriation submitted for this purpose, but unfortunately the desired provision was not made.

Prof. Howard M. Ballou, of Honolulu, has submitted from time to time additional titles for the List of Works Relating to Hawaii, compiled in collaboration with the late Dr. Cyrus Thomas. The material for this bibliography is in the hands of Mr. Felix Neumann for final editorial revision, and it is expected that the entire manuscript will soon be ready for composition.

The large collection of manuscripts in possession of the bureau has been in continuous charge of Mr. J. N. B. Hewitt. A few noteworthy additions were made during the year besides those prepared or which are in process of preparation by members of the staff. Among these may be mentioned the "Dictionary of Words that have been Made Known in or Introduced into English from the Indians of North, Central, and South America," by the late William R. Gerard, a work requiring many years of assiduous labor. The manuscript was acquired for a nominal consideration from Mrs. Gerard, and it is the design to publish the dictionary as soon as it can be given the customary editorial attention. Before his death



Mr. Gerard presented to the bureau an original manuscript of 31 pages, with 21 diagrams, on "Terminations of the Algonquian Transitive and Indefinite Verbs and their Meanings," to which Dr. Truman Michelson has appended a criticism.

Additional manuscripts worthy of special note are the following:

J. P. Dunn: Translation of Miami-Peoria Dictionary, Part 2, *Aller to Assomer*. The original of this dictionary is in the John Carter Brown Library, of Providence, through whose courteous librarian, Mr. George Parker Winship, the bureau has been provided with a photostat copy.

J. P. Dunn: Translation of the History of Genesis, second chapter, from the Miami-Peoria Dictionary above cited.

Cyrus Byington: Manuscript notebook, 1844-1848 and 1861. Kindly presented by Mrs. Eliza Innes, daughter of this noted missionary to the Choctaw.

James A. Gilfillan: Chippewa Sentences. A small quarto notebook kindly presented by Miss Emily Cook, of the Office of Indian Affairs.

Parker Marshall: Various memoranda on the location of the Natchez Trace.

H. A. Scomp: Comparative Choctaw and Creek Dictionary, consisting of 1,054 sheets, 20 by 36 inches.

Francisco Pareja: Confessionario, in Spanish and Timuqua. Photostat copy furnished by the courtesy of the New York Historical Society.

Francisco Pareja: Catechismo, in Timuqua. Photostat copy furnished by the courtesy of the New York Historical Society.

Francisco Pareja: Explicacion de la Doctrina, in Timuqua. Photostat copy furnished by the courtesy of the New York Historical Society.

V. C. Fredericksen: Origin of the Eskimo and their Wanderings, with photographs. (The author is a Danish missionary in Greenland.)

From time to time the bureau has been put to considerable expense in having photostat copies made of unique manuscripts and of excessively rare books indispensable to its researches. It is therefore fortunate that the opportunity was afforded, late in the fiscal year, to acquire a photostat apparatus which has since been in constant service. The urgent need of such an instrument was made especially manifest when the Rev. George Worpenberg, S. J., librarian of St. Marys College, St. Marys, Kans., generously accorded the bureau the privilege of copying a number of valuable original linguistic manuscripts in the archives of the college, pertaining chiefly to the Potawatomi and including a dictionary and a grammar recorded by the late Father Maurice Gaillard. Manuscript copies of these voluminous linguistic works could have been made only after infinite labor by an expert and at an expense far exceeding the entire cost of the photostat apparatus. By the close of the year the making of the facsimile reproductions had been commenced by Mr. Albert Sweeney, under the immediate direction of Mr. De Lancey Gill, illustrator.

An opportunity was afforded at the close of the year to replace the wooden partition and ceiling of the manuscript room with terra cotta and to install a fireproof door and window coverings, thus giving for the first time adequate protection to the bureau's large collection of priceless unpublished material.

## PUBLICATIONS.

The editorial work of the bureau has been continued by Mr. J. G. Gurley, editor, who has been assisted from time to time by Mrs. Frances S. Nichols. The following publications were received from the press during the year:

*Bulletin 53*, "Chippewa Music—II," by Frances Densmore.

*Bulletin 56*, "Ethnozoology of the Tewa Indians," by Junius Henderson and John P. Harrington.

"Coos: An Illustrative Sketch," by Leo J. Frachtenberg. Extract from Handbook of American Indian Languages (*Bulletin 40*), part 2.

The status of other publications, now in press, is as follows:

The proof reading of the *Twenty-ninth Annual Report*, the accompanying paper of which, entitled "Ethnogeography of the Tewa Indians," by John P. Harrington, is an exhaustive memoir presenting many technical difficulties, was nearly completed during the year. About two-thirds of the memoir is in page form.

The *Thirtieth Annual Report* comprised originally, in addition to the administrative section, three memoirs: (1) "Tsimshian Mythology," by Franz Boas; (2) "Ethnobotany of the Zuñi Indians," by Matilda Coxe Stevenson; (3) "An Inquiry into the Animism and Folk-lore of the Guiana Indians," by Walter E. Roth. Extensive additions to the first-named memoir, received after the report had been put into type, necessitated the division of the contents, and accordingly this section was transferred to the *Thirty-first Report*. Approximately two-thirds of "Tsimshian Mythology" has been paged, and the Zuñi memoir also, now the first accompanying paper of the *Thirtieth Annual*, is in process of paging.

To the *Thirty-second Report* will be assigned a memoir entitled "Seneca Myths and Fiction," collected by Jeremiah Curtin and J. N. B. Hewitt and edited with an introduction by the latter, the manuscript of which is about ready for editorial revision.

*Bulletin 40 (pt. 2)*, "Handbook of American Indian Languages." The work on this bulletin has been carried along steadily under the immediate supervision of its editor, Dr. Boas. Two sections—Takelma and Coos—have been issued in separate form (aggregating 429 pages), and two additional sections, dealing with the Chukchee and Siuslaw languages respectively, are in type, the former being "made up" to the extent of about 50 pages.

*Bulletin 46*, "A Dictionary of the Choctaw Language," by Cyrus Byington (edited by John R. Swanton and Henry S. Halbert). The first (Choctaw-English) section of this work was completed during the year and is practically ready for the press. The manuscript of the second section (English-Choctaw directory), comprising 36,008 entries on cards, was sent to the Printing Office April 30 to June 13, but no proof had been received at the close of the year.

*Bulletin 55*, "Ethnobotany of the Tewa Indians," by Wilfred W. Robbins, John P. Harrington, and Barbara Freire-Marreco. After this bulletin was in type it was found advisable to incorporate a considerable amount of valuable material, subsequently gathered and kindly offered by Miss Freire-Marreco. The change involved recasting in a large measure the original work. The second galley proof is in the hands of Miss Freire-Marreco for final revision.

*Bulletin 57*, "An Introduction to the Study of the Maya Hieroglyphs," by Sylvanus Griswold Morley. The manuscript and illustrations of this memoir were submitted to the Public Printer the latter part of April. Engraver's proof of the illustrations, with the exception of a few pieces of color work, have been received and approved. Owing to the heavy pressure of public business, the Printing Office had been unable to furnish proof of the letterpress by the close of the year.

*Bulletin 58*, "List of Publications of the Bureau of American Ethnology." The page proof of this bulletin is in the hands of the printers for slight correction, preparatory to placing it on the press.

The total number of publications of the bureau distributed during the year was 12,819, classified as follows:

Report volumes and separate papers.....	2,810
Bulletins.....	9,943
Contributions to North American Ethnology.....	22
Introductions.....	5
Miscellaneous publications.....	39
Total.....	12,819

As during several years past the extensive correspondence arising from the constant demand for the publications of the bureau has been in immediate and efficient charge of Miss Helen Munroe and Mr. E. L. Springer, of the Smithsonian Institution, assisted by Mr. Thomas F. Clark, jr. The distribution of publications has been made in accordance with law and with entire satisfaction by the office of the superintendent of documents on order of the bureau.

#### ILLUSTRATIONS.

The preparation of the illustrations for the publications of the bureau, the making of photographs of the members of delegations of Indians visiting Washington, and the developing and printing of negatives made by the staff of the bureau during the prosecution of their field work have been in charge of Mr. DeLancey Gill, illustrator, assisted successively by Mr. Walter Stenhouse and Mr. Albert Sweeney. In addition the numerous photostat copies of manuscripts and books, aggregating about 2,500 exposures, have been made under Mr. Gill's supervision, as elsewhere mentioned. Of the visiting deputations, rep-

representing 17 tribes, 79 photographic exposures were made; 92 negatives of ethnologic subjects were required for reproduction as illustrations; 512 negatives made by the members of the staff in the field were developed and 381 prints made therefrom; 105 photographs were printed for presentation to Indians and 627 for publication, exchange, and special distribution. In addition to the photographic work, which constitutes the major part of the illustrative material required by the bureau, 54 drawings were made for reproduction.

The series of photographs, representing 55 tribes, which had been exhibited by the New York Public Library and the Public Library Commission of Indiana, was borrowed in June by the Providence Public Library for a similar purpose.

#### LIBRARY.

The reference library of the bureau, which consists of 19,240 books, about 12,894 pamphlets, and several thousand unbound periodicals, has been in continuous charge of Miss Ella Leary, librarian, assisted by Mrs. Ella Slaughter. During the year 708 books were accessioned, of which 143 were acquired by purchase and 137 by gift and exchange, the remaining 428 being represented by volumes of serials that hitherto had been neither bound nor recorded. The periodicals currently received numbered 629, of which only 16 were obtained by purchase, the remainder being received through exchange. Of pamphlets, 150 were acquired. During the year 1,195 volumes were sent to the bindery and of these 695 were bound and returned to the bureau.

The endeavor to supply deficiencies in the sets of publications of institutions of learning has continued without remission. Among the more important accessions of this kind during the year were *Zeitschrift der Gesellschaft für Erdkunde zu Berlin*, 20 volumes; *Instituto Geografico Argentino, Boletin*, 10 volumes; and *Königliches Museum für Völkerkunde, Veröffentlichungen*, 8 volumes.

The librarian has prepared a monthly bulletin of accessions for the use of the staff, and has furnished information and compiled bibliographic notes for the use of correspondents. In addition to the constant drafts on the library of the bureau requisition was made on the Library of Congress during the year for an aggregate of 300 volumes for official use, and in turn the bureau library was frequently consulted by officers of other Government establishments.

An appropriation having been made by Congress, in behalf of the Institution, for installing modern steel bookstacks in the eastern end of the large exhibition hall on the first floor of the Smithsonian building, and provision having been made for affording the proposed increased facilities to the library of the bureau, which for four and a half years had been installed in the eastern galleries of the hall mentioned, the books therein were removed in February to the gallery

and main floor of the western end of the hall and the eastern galleries were demolished. Although this work of removal occupied two weeks, it was done without confusion and practically without cessation of the library's activities. The new stacks were in process of erection before the close of the fiscal year.

#### COLLECTIONS.

The following collections were acquired by the bureau or by members of its staff, and, having served the purpose of study, were transferred to the National Museum, as required by law:

- Eight fragments of ancient British pottery. Gift to the bureau by Rev. Robert C. Nightingale, Swaffam, Norfolk, England. (55735.)
- Potsherds, fragments of human bones, and three heads. Gift to the bureau by Mrs. Bruce Reid, Port Arthur, Tex. (55758.)
- Parts of five skeletons (three complete skulls and fragments of two skulls) from a burial cist in a cave about 20 miles south of Grant, N. Mex. Collected by F. W. Hodge, Bureau of American Ethnology. (56134.)
- Thirty-one ethnological objects from the Cherokee and Catawba Indians. Collected by James Mooney, Bureau of American Ethnology. (56312.)
- Six photographs of Aztec antiquities. Purchased from W. W. Blake, City of Mexico. (56609.)
- Stone phallus from Mesa Verde, Colo. Gift to the bureau by H. C. Lay, Telluride, Colo. (56719.)
- Arrow point found on the north fork of Roanoke River, about 3 miles from Blacksburg, Va. Gift to the bureau by Prof. Otto C. Burkhart, Virginia Polytechnic Institute, Blacksburg, Va. (56679.)

#### PROPERTY.

The principal property of the bureau consists of its library, comprising approximately 35,000 books and pamphlets, a large collection of manuscripts for reference or in process of preparation for publication, and several thousand photographic negatives. With the exception of a portion of the library, this material could not be duplicated. In addition, the bureau possesses a photostat apparatus with electric-light equipment, several cameras, dictagraphs, and other appliances for use in conducting scientific research in the field and the office, necessary office furniture and equipment, and a limited supply of stationery, supplies, etc. Also under control of the bureau, but in immediate custody of the Public Printer, as required by law, is a stock of numerous publications, chiefly annual reports and bulletins.

#### MISCELLANEOUS.

*Quarters.*—The only improvements made in the quarters occupied by the bureau in the Smithsonian building, as set forth in the last report, have been those incident to the reconstruction of the library and the fireproofing of the manuscript room, above alluded to, and the painting of the walls of four rooms, made necessary partly by

inadequate lighting. In addition to the space previously occupied, a room on the fourth floor of the eastern end of the Smithsonian building was assigned temporarily to the bureau for the use of two members of its staff.

*Office force.*—The personnel of the office has remained unchanged, with the exception of the resignation of one messenger boy and the appointment of another. It has been necessary to employ a copyist from time to time in connection with the editing of Byington's Choctaw Dictionary. The correspondence of the bureau has been conducted in the same manner as set forth in the last annual report and as hereinbefore mentioned.

*Recommendations.*—The chief needs of the Bureau of American Ethnology lie in the extension of its researches to fields as yet unexploited. Attention has frequently been called to the necessity of pursuing studies among Indian tribes which are rapidly becoming extinct, or modified by their intimate contact with civilization. These researches can not be conducted unless the means are provided, since the present limited scientific corps, with inadequate allotments of money to meet the expenses of extended field investigations, is not equal to the immense amount of work to be done. Unfortunately many opportunities for conducting these researches which were possible a few years ago have passed away, owing to the death of older Indians who alone possessed certain knowledge of their race. Much can still be done, however, if only the means are afforded.

It is scarcely necessary to repeat, in connection with this general recommendation, the estimate for an increase, amounting to \$24,800, in the appropriation for the bureau and the brief reasons for urging the grant of this additional sum, inasmuch as these items will be found in the printed Estimates of Appropriations, 1915-16.

Respectfully submitted.

F. W. HODGE,  
*Ethnologist-in-charge.*

THE SECRETARY OF THE SMITHSONIAN INSTITUTION.

### APPENDIX 3.

#### REPORT ON THE INTERNATIONAL EXCHANGES.

SIR: I have the honor to submit the following report on the operations of the International Exchange Service during the fiscal year ending June 30, 1914:

The congressional appropriation for the support of the service during the year, including the allotment for printing and binding, was \$32,200 (the same amount as appropriated for the past six years), and the repayments from private and departmental sources for services rendered aggregated \$5,264.18, making the total available resources for carrying on the exchange system \$37,464.18.

During the year 1914 the total number of packages handled was 341,667, an increase of 3,046 as compared with the preceding year. The weight of these packages was 566,985 pounds, a decrease of 26,984 pounds.

The number and weight of the packages of different classes are indicated in the following table:

	Packages.		Weight.	
	Sent.	Received.	Sent.	Received.
			<i>Pounds.</i>	<i>Pounds.</i>
United States parliamentary documents sent abroad.....	131,469		94,759	
Publications received in return for parliamentary documents.....		2,103		9,913
United States departmental documents sent abroad.....	99,826		199,198	
Publications received in return for departmental documents.....		8,994		19,080
Miscellaneous scientific and literary publications sent abroad.....	60,844		130,524	
Miscellaneous scientific and literary publications received from abroad for distribution in the United States.....		38,431		113,511
Total.....	292,139	49,528	424,481	142,504
Grand total.....	341,667		566,985	

In April, 1914, the American-Chinese Publication Exchange Department of the Shanghai Bureau of Foreign Affairs, which was designated a few years ago by the Chinese Government as the depository of the set of United States governmental documents sent to that Government, signified its willingness to accept packages for miscellaneous addresses throughout the Chinese Republic

and forward them to their various destinations. Consignments intended for distribution in China are, therefore, now sent in care of that department instead of the Zi-ka-wei Observatory at Shanghai.

In this connection, it is desired to record here the Institution's appreciation of the valuable service rendered by the Zi-ka-wei Observatory in the distribution of exchanges to correspondents in China for nearly a quarter of a century.

The Smithsonian Institution, through the International Exchange Service, continues to solicit publications for both foreign and domestic governmental and scientific establishments. At the request of the British ambassador, which was referred to this Institution by the Department of State, many United States official publications were procured for the various Canadian departments and bureaus. As formerly, aid has been rendered the Library of Congress in obtaining from foreign Governments certain documents especially desired for its collections.

Of the 2,465 boxes used in forwarding exchanges to foreign agencies for distribution, 280 boxes contained full sets of United States official documents for authorized depositories and 2,185 were filled with departmental and other publications for depositories of partial sets and for miscellaneous correspondents. The number of boxes sent to each foreign country and the dates of transmission are shown in the following table:

*Consignments of exchanges for foreign countries.*

Country.	Number of boxes.	Date of transmission.
ARGENTINA.....	45	July 28, Aug. 22, Sept. 30, Oct. 27, Nov. 29, 1913; Jan. 20, Feb. 26, Apr. 9, June 3, 1914.
AUSTRIA.....	91	July 16, Aug. 12, Sept. 17, Oct. 15, Nov. 12, Dec. 10, 1913; Jan. 14, Feb. 18, Mar. 18, Apr. 17, May 19, June 17, 1914.
BELGIUM.....	64	July 19, Aug. 8, Sept. 5, 27, Oct. 11, Nov. 8, 29, Dec. 20, 1913; Jan. 24, Feb. 19, Mar. 21, Apr. 23, May 21, June 29, 1914.
BOLIVIA.....	6	July 30, Oct. 4, Nov. 26, 1913; Feb. 4, Mar. 7, June 30, 1914.
BRAZIL.....	32	July 28, Aug. 22, Sept. 30, Oct. 27, Nov. 29, 1913; Jan. 20, Feb. 26, Apr. 9, June 3, 1914.
BRITISH COLONIES.....	20	July 18, Aug. 2, 23, Sept. 6, 20, Oct. 10, 24, Nov. 14, 21, Dec. 5, 1913; Jan. 10, 24, Feb. 6, Mar. 14, Apr. 4, 18, May 2, 24, June 6, 27, 1914.
BRITISH GUIANA.....	4	Nov. 5, Dec. 17, 1913; Mar. 14, June 30, 1914.
BULGARIA.....	6	Oct. 23, Nov. 25, 1913; Feb. 7, Mar. 14, May 14, June 24, 1914.
CANADA.....	5	Sept. 22, 1913; Jan. 12, Feb. 21, Apr. 14, May 12, 1914.
CHILE.....	23	July 29, Aug. 3, Sept. 30, Oct. 27, Nov. 28, 1913; Jan. 20, Feb. 27, Apr. 17, June 4, 1914.
CHINA.....	38	July 30, Aug. 31, Sept. 30, Nov. 15, 1913; Jan. 8, Mar. 9, Apr. 29, May 21, June 16, 1914.
COLOMBIA.....	16	July 30, Nov. 26, 1913; Jan. 21, May 14, June 24, 1914.
COSTA RICA.....	16	July 30, Oct. 6, Nov. 26, 1913; Jan. 21, Mar. 7, May 28, June 30, 1914.
CUBA.....	5	Sept. 22, 1913; Jan. 12, Feb. 21, Apr. 14, May 12, 1914.
DENMARK.....	40	July 22, Aug. 19, Sept. 23, Oct. 21, Nov. 19, Dec. 20, 1913; Jan. 29, Feb. 21, Mar. 25, Apr. 24, May 27, June 25, 1914.



*Consignments of exchanges for foreign countries—Continued.*

Country.	Number of boxes.	Date of transmission.
ECUADOR.....	7	July 30, Oct. 6, Nov. 26, 1913; Feb. 4, Mar. 7, May 21, June 30, 1914.
EGYPT.....	11	Sept 11, Oct. 25, Nov. 29, Dec. 30, 1913; Jan. 23, Feb. 21, Apr. 3, 28, June 10, 1914.
FRANCE.....	180	July 10, 31, Aug. 14, 28, Sept. 18, Oct. 8, 29, Nov. 19, Dec. 3, 24, 1913; Jan. 14, Feb. 4, 18, Mar. 11, Apr. 8, May 6, June 10, 1914.
GERMANY.....	433	July 1, 8, 15, 22, 29, 30, Aug. 5, 12, 19, 26, 29, Sept. 2, 9, 16, 23, 30, Oct. 7, 14, 21, 28, Nov. 4, 11, 19, 25, Dec. 2, 9, 16, 23, 30, 1913; Jan. 6, 13, 20, 27, Feb. 3, 10, 17, 24, Mar. 3, 10, 17, 24, 30, Apr. 7, 15, 28, May 5, 12, 26, June 2, 16, 23, 30, 1914.
GREAT BRITAIN AND IRELAND.	448	July 12, 18, 25, Aug. 2, 8, 15, 23, 29, Sept 6, 12, 20, 26, Oct. 3, 10, 17, 24, Nov. 1, 7, 14, 21, 29, Dec. 5, 12, 19, 27, 1913; Jan. 3, 10, 17, 24, 31, Feb. 6, 13, 20, 27, Mar. 6, 14, 20, 27, Apr. 4, 11, 18, 25, May 2, 9, 23, June 1, 6, 13, 20, 26, 1914.
GREECE.....	16	July 22, Aug. 23, Sept. 25, Oct. 13, Dec. 17, 1913; Jan. 31, Mar. 7, May 15, June 23, 1914.
GUATEMALA.....	7	July 30, Oct. 6, Nov. 28, 1913; Feb. 4, Mar. 7, May 21, June 30, 1914.
HAITI.....	5	Sept. 22, 1913; Jan. 12, Feb. 21, Apr. 14, May 12, 1914.
HONDURAS.....	5	Aug. 28, Nov. 15, 1913; Feb. 5, Mar. 7, June 12, 1914.
HUNGARY.....	39	July 16, Aug. 12, Sept. 17, Nov. 12, Dec. 10, 1913; Jan. 14, Feb. 18, Mar. 18, Apr. 17, May 19, June 17, 1914.
INDIA.....	50	July 12, 18, 25, Aug. 2, 15, 23, Sept. 6, 20, 26, Oct. 10, 17, 24, Nov. 14, Dec. 5, 19, 1913; Jan. 3, 10, 24, Feb. 6, 13, 20, Mar. 6, 14, 20, 27, Apr. 11, 25, May 2, 23, June 6, 20, 25, 1914.
ITALY.....	86	Aug. 7, Sept. 11, 27, Oct. 11, 25, Nov. 8, 29, Dec. 30, 1913; Jan. 23, Feb. 21, Mar. 7, Apr. 28, June 30, 1914.
JAMAICA.....	7	Aug. 27, Oct. 30, Nov. 29, Dec. 7, 1913; Mar. 20, June 12, 25, 1914.
JAPAN.....	54	July 24, Aug. 20, Sept. 24, Oct. 23, Nov. 25, Dec. 20, 1913; Jan. 27, Feb. 24, Apr. 28, June 5, 1914.
KOREA.....	4	Aug. 27, Oct. 31, 1913; Feb. 7, June 12, 1914.
LIBERIA.....	5	July 31, Oct. 31, Nov. 29, 1913; Mar. 7, May 14, 1914.
LOURENÇO MARQUEZ.	4	Aug. 27, Dec. 17, 1913; June 18, 1914.
MANITOBA.....	5	Sept. 22, 1913; Jan. 12, Feb. 21, Apr. 14, May 12, 1914.
MEXICO.....	5	Sept. 22, 1913; Jan. 12, Feb. 21, Apr. 14, May 12, 1914.
MONTENEGRO.....	2	Dec. 17, 1913; June 18, 1914.
NETHERLANDS.....	61	July 15, Aug. 5, 26, Sept. 23, Oct. 14, 28, Nov. 18, Dec. 16, 1913; Jan. 6, Feb. 3, 24, Mar. 24, Apr. 21, May 12, June 9, 1914.
NEWFOUNDLAND.....	2	Jan. 5, June 30, 1914.
NEW SOUTH WALES..	31	July 24, Aug. 20, Sept. 25, Oct. 23, Nov. 22, Dec. 23, 1913; Jan. 27, Feb. 25, Mar. 25, May 7, June 12, 1914.
NEW ZEALAND.....	25	July 24, Aug. 20, Sept. 25, Oct. 23, Nov. 25, Dec. 23, 1913; Jan. 29, Feb. 25, Mar. 27, May 7, June 16, 1914.
NICARAGUA.....	5	Aug. 28, Nov. 15, 1913; Feb. 5, Mar. 7, June 12, 1914.
NORWAY.....	31	July 22, Aug. 19, Sept. 23, Oct. 21, Nov. 19, Dec. 20, 1913; Jan. 30, Feb. 21, Mar. 25, Apr. 24, May 28, June 25, 1914.
ONTARIO.....	5	Sept. 22, 1913; Jan. 12, Feb. 21, Apr. 14, May 12, 1914.
PALESTINE.....	7	Sept. 30, 1913.
PARAGUAY.....	5	Aug. 28, Nov. 15, 1913; Feb. 4, May 15, June 30, 1914.
PERU.....	16	July 29, Aug. 22, Sept. 30, Oct. 27, Nov. 29, 1913; Jan. 20, Feb. 27, June 4, 1914.
PORTUGAL.....	23	July 22, Aug. 19, Sept. 23, Oct. 21, Nov. 19, Dec. 20, 1913; Jan. 30, Feb. 21, Mar. 25, Apr. 24, May 28, June 25, 1914.
QUEBEC.....	5	Sept. 22, 1913; Jan. 12, Feb. 21, Apr. 14, May 12, 1914.
QUEENSLAND.....	13	July 24, Aug. 20, Sept. 25, Oct. 23, Nov. 25, Dec. 23, 1913; Jan. 29, Feb. 25, Mar. 27, May 7, June 16, 1914.

*Consignments of exchanges for foreign countries—Continued.*

Country.	Number of boxes.	Date of transmission.
ROUMANIA.....	13	July 31, Aug. 30, Sept. 25, Oct. 23, Nov. 29, 1913; Feb. 7, Mar. 12, May 14, June 24, 1914.
RUSSIA.....	92	July 17, Aug. 13, Sept. 18, Oct. 16, Nov. 13, Dec. 11, 1913; Jan. 16, 24, Feb. 19, Mar. 19, May 20, June 18, 1914.
SALVADOR.....	8	July 30, Oct. 6, 24, Nov. 28, 1913; Feb. 4, Mar. 7, June 12, 1914.
SERVIA.....	13	July 17, Sept. 25, Nov. 15, 1913; Jan. 21, Mar. 7, May 28, June 24, 1914.
SIAM.....	5	Aug. 27, Nov. 29, 1913; Feb. 7, Mar. 28, June 30, 1914.
SOUTH AUSTRALIA.....	18	July 24, Aug. 20, Sept. 25, Oct. 23, Nov. 25, Dec. 23, 1913; Jan. 28, Feb. 25, Mar. 27, May 7, June 15, 1914.
SPAIN.....	30	Aug. 7, Sept. 11, Oct. 25, Nov. 29, Dec. 30, 1913; Jan. 23, Feb. 21, Apr. 3, June 10, 1914.
SWEDEN.....	72	July 17, Aug. 14, Sept. 18, Oct. 16, Nov. 13, Dec. 11, 1913; Jan. 16, Feb. 19, Mar. 19, Apr. 20, May 20, June 18, 1914.
SWITZERLAND.....	54	July 19, Aug. 7, Sept. 5, 27, Oct. 11, Nov. 8, 29, Dec. 20, 1913; Jan. 24, Feb. 19, Mar. 21, Apr. 23, May 21, June 19, 1914.
SYRIA.....	6	Apr. 26, May 27, June 25, 1914.
TASMANIA.....	12	Aug. 2, 23, Sept. 6, 20, Oct. 24, Nov. 14, Dec. 19, 1913; Feb. 13, Apr. 11, 25, June 25, 1914.
TRINIDAD.....	3	Mar. 7, 30, June 12, 1914.
TURKEY.....	14	Aug. 30, Sept. 30, Oct. 23, Nov. 15, 1913; Jan. 8, 23, Feb. 28, Mar. 7, Apr. 30, May 27, June 25, 1914.
UNION OF SOUTH AFRICA.	24	Sept. 25, Oct. 31, Nov. 29, 1913; Jan. 26, Feb. 28, May 13, June 23, 1914.
URUGUAY.....	21	July 29, Aug. 22, Oct. 4, Nov. 26, 1913; Jan. 21, Feb. 27, June 4, 1914.
VENEZUELA.....	11	Oct. 4, Nov. 26, 1913; Jan. 21, Mar. 7, May 28, June 30, 1914.
VICTORIA.....	29	July 24, Aug. 20, Sept. 25, Oct. 23, Nov. 22, Dec. 23, 1913; Jan. 28, Feb. 25, Mar. 27, May 7, June 15, 1914.
WESTERN AUSTRALIA.	24	July 12, 25, Aug. 23, Sept. 6, 20, Oct. 3, 17, 24, Nov. 21, Dec. 5, 19, 1913; Jan. 10, 24, Feb. 6, 20, Mar. 6, 20, Apr. 4, June 13, 1914.
WINDWARD AND LEEWARD ISLANDS.	3	Oct. 31, 1913; Feb. 7, June 12, 1914.

In October, 1913, the New York forwarding agents informed the Institution that boxes 1179 and 1598, which were sent to them under date of March 28 and May 15, 1913, respectively, for transmission to his Japanese Majesty's residency general at Seoul, Korea, had been lost in transit by the steamship company. These consignments contained publications from both governmental and scientific establishments for distribution to Korean correspondents, and duplicates of as many of them as were available for distribution were obtained and forwarded to their destinations.

FOREIGN DEPOSITORIES OF UNITED STATES GOVERNMENTAL DOCUMENTS.

No additions were made to the foreign depositories of full or partial sets during the year, 56 full sets of United States official publications and 36 partial sets now being forwarded regularly to designated depositories abroad.

The recipients of full and partial sets are as follows:

DEPOSITORIES OF FULL SETS.

- ARGENTINA: Ministerio de Relaciones Exteriores, Buenos Aires.  
 AUSTRALIA: Library of the Commonwealth Parliament, Melbourne.  
 AUSTRIA: K. K. Statistische Zentral-Kommission, Vienna.  
 BADEN: Universitäts-Bibliothek, Freiburg. (Depository of the Grand Duchy of Baden.)  
 BAVARIA: Königliche Hof- und Staats-Bibliothek, Munich.  
 BELGIUM: Bibliothèque Royale, Brussels.  
 BOMBAY: Secretary to the Government, Bombay.  
 BRAZIL: Bibliotheca Nacional, Rio de Janeiro.  
 BUENOS AIRES: Biblioteca de la Universidad Nacional de La Plata. (Depository of the Province of Buenos Aires.)  
 CANADA: Library of Parliament, Ottawa.  
 CHILE: Biblioteca del Congreso Nacional, Santiago.  
 CHINA: American-Chinese Publication Exchange Department, Shanghai Bureau of Foreign Affairs, Shanghai.  
 COLOMBIA: Biblioteca Nacional, Bogota.  
 COSTA RICA: Oficina de Depósito y Canje Internacional de Publicaciones, San José.  
 CUBA: Secretaria de Estado (Asuntos Generales y Canje Internacional), Habana.  
 DENMARK: Kongelige Bibliotheket, Copenhagen.  
 ENGLAND: British Museum, London.  
 FRANCE: Bibliothéque Nationale, Paris.  
 GERMANY: Deutsche Reichstags-Bibliothek, Berlin.  
 GLASGOW: City Librarian, Mitchell Library, Glasgow.  
 GREECE: Bibliothéque Nationale, Athens.  
 HAITI: Secrétairerie d'État des Relations Extérieures, Port au Prince.  
 HUNGARY: Hungarian House of Delegates, Budapest.  
 INDIA: Department of Education (Books), Government of India, Calcutta.  
 IRELAND: National Library of Ireland, Dublin.  
 ITALY: Biblioteca Nazionale Vittorio Emanuele, Rome.  
 JAPAN: Imperial Library of Japan, Tokyo.  
 LONDON: London School of Economics and Political Science. (Depository of the London County Council.)  
 MANITOBA: Provincial Library, Winnipeg.  
 MEXICO: Instituto Bibliográfico, Biblioteca Nacional, Mexico.  
 NETHERLANDS: Library of the States General, The Hague.  
 NEW SOUTH WALES: Public Library of New South Wales, Sydney.  
 NEW ZEALAND: General Assembly Library, Wellington.  
 NORWAY: Storthingets Bibliothek, Christiania.  
 ONTARIO: Legislative Library, Toronto.  
 PARIS: Préfecture de la Seine.  
 PERU: Biblioteca Nacional, Lima.  
 PORTUGAL: Bibliotheca Nacional, Lisbon.  
 PRUSSIA: Königliche Bibliothek, Berlin.  
 QUEBEC: Library of the Legislature of the Province of Quebec, Quebec.  
 QUEENSLAND: Parliamentary Library, Brisbane.  
 RUSSIA: Imperial Public Library, St. Petersburg.  
 SAXONY: Königliche Oeffentliche Bibliothek, Dresden.  
 SERVIA: Section Administrative du Ministère des Affaires Étrangères, Belgrade.  
 SOUTH AUSTRALIA: Parliamentary Library, Adelaide.

- SPAIN: Servicio del Cambio Internacional de Publicaciones, Cuerpo Facultativo de Archiveros, Bibliotecarios y Arqueólogos, Madrid.
- SWEDEN: Kungliga Biblioteket, Stockholm.
- SWITZERLAND: Bibliothéque Fédérale, Berne.
- TASMANIA: Parliamentary Library, Hobart.
- TURKEY: Department of Public Instruction, Constantinople.
- UNION OF SOUTH AFRICA: State Library, Pretoria, Transvaal.
- URUGUAY: Oficina de Canje Internacional de Publicaciones, Montevideo.
- VENEZUELA: Biblioteca Nacional, Caracas.
- VICTORIA: Public Library, Melbourne.
- WESTERN AUSTRALIA: Public Library of Western Australia, Perth.
- WÜRTEMBERG: Königliche Landesbibliothek, Stuttgart.

## DEPOSITORIES OF PARTIAL SETS.

- ALBERTA: Provincial Library, Edmonton.
- ALSACE-LORRAINE: K. Ministerium für Elsass-Lothringen, Strassburg.
- BOLIVIA: Ministerio de Colonización y Agricultura, La Paz.
- BREMEN: Senatskommission für Reichs- und Auswärtige Angelegenheiten.
- BRITISH COLUMBIA: Legislative Library, Victoria.
- BRITISH GUIANA: Government Secretary's Office, Georgetown, Demerara.
- BULGARIA: Minister of Foreign Affairs, Sofia.
- CEYLON: United States Consul, Colombo.
- ECUADOR: Biblioteca Nacional, Quito.
- EGYPT: Bibliothéque Khédiviale, Cairo.
- FINLAND: Chancery of Governor, Helsingfors.
- GUATEMALA: Secretary of the Government, Guatemala.
- HAMBURG: Senatskommission für die Reichs- und Auswärtigen Angelegenheiten.
- HESSE: Grossherzogliche Hof-Bibliothek, Darmstadt.
- HONDURAS: Secretary of the Government, Tegucigalpa.
- JAMAICA: Colonial Secretary, Kingston.
- LIBERIA: Department of State, Monrovia.
- LOURENÇO MARQUEZ: Government Library, Lourenço Marquez.
- LÜBECK: President of the Senate.
- MADRAS, PROVINCE OF: Chief Secretary to the Government of Madras, Public Department, Madras.
- MALTA: Lieutenant Governor, Valetta.
- MONTENEGRO: Ministère des Affaires Étrangères, Cetinje.
- NEW BRUNSWICK: Legislative Library, Fredericton.
- NEWFOUNDLAND: Colonial Secretary, St. John's.
- NICARAGUA: Superintendente de Archivos Nacionales, Managua.
- NORTHWEST TERRITORIES: Government Library, Regina.
- NOVA SCOTIA: Provincial Secretary of Nova Scotia, Halifax.
- PANAMA: Secretaria de Relaciones Exteriores, Panama.
- PARAGUAY: Oficina General de Inmigracion, Asuncion.
- PRINCE EDWARD ISLAND: Legislative Library, Charlottetown.
- ROUMANIA: Academia Romana, Bucharest.
- SALVADOR: Ministerio de Relaciones Exteriores, San Salvador.
- SIAM: Department of Foreign Affairs, Bangkok.
- STRAITS SETTLEMENTS: Colonial Secretary, Singapore.
- UNITED PROVINCES OF AGRA AND OUDH: Under Secretary to Government, Allahabad.
- VIENNA: Bürgermeister der Haupt- und Residenz-Stadt.

## INTERPARLIAMENTARY EXCHANGE OF OFFICIAL JOURNALS.

A list of the countries which have entered into interparliamentary exchange of official journals with the United States is given below:

Argentine Republic.	Italy.
Australia.	Liberia.
Austria.	New South Wales.
Baden.	New Zealand.
Belgium.	Portugal.
Brazil.	Prussia.
Buenos Aires, Province of.	Queensland.
Canada.	Roumania.
Cuba.	Russia.
Denmark.	Servia.
France.	Spain.
Great Britain.	Switzerland.
Greece.	Transvaal.
Guatemala.	Union of South Africa.
Honduras.	Uruguay.
Hungary.	Western Australia.

As will be noted, there are at present 32 countries with which the immediate exchange is conducted, no additions having been made during the year.

## LIST OF BUREAUS OR AGENCIES THROUGH WHICH EXCHANGES ARE TRANSMITTED.

The following is a list of the bureaus or agencies through which exchanges are transmitted:

ALGERIA, *via* France.

ANGOLA, *via* Portugal.

ARGENTINA: Comisión Protectora de Bibliotecas Populares, Reconquista 538, Buenos Aires.

AUSTRIA: K. K. Statistische Zentral-Kommission, Vienna.

AZORES, *via* Portugal.

BELGIUM: Service Belge des Échanges Internationaux, Rue des Longs-Chariots 46, Brussels.

BOLIVIA: Oficina Nacional de Estadística, La Paz.

BRAZIL: Serviço de Permutações Internacionais, Bibliotheca Nacional, Rio de Janeiro.

BRITISH COLONIES: Crown Agents for the Colonies, London.<sup>1</sup>

BRITISH GUIANA: Royal Agricultural and Commercial Society, Georgetown.

BRITISH HONDURAS: Colonial Secretary, Belize.

BULGARIA: Institutions Scientifiques de S. M. le Roi de Bulgarie, Sofia.

CANARY ISLANDS, *via* Spain.

CHILE: Servicio de Canjes Internacionales, Biblioteca Nacional, Santiago.

CHINA: American-Chinese Publication Exchange Department, Shanghai Bureau of Foreign Affairs, Shanghai.

COLOMBIA: Oficina de Canjes Internacionales y Reparto, Biblioteca Nacional, Bogota.

<sup>1</sup> This method is employed for communicating with several of the British colonies with which no medium is available for forwarding exchanges direct.

- COSTA RICA: Oficina de Depósito y Canje Internacional de Publicaciones, San José.
- DENMARK: Kongelige Danske Videnskabernes Selskab, Copenhagen.
- DUTCH GUIANA: Surinaamsche Koloniale Bibliotheek, Paramaribo.
- ECUADOR: Ministerio de Relaciones Exteriores, Quito.
- EGYPT: Government Publications Office, Printing Department, Cairo.
- FRANCE: Service Français des Échanges Internationaux, 110 Rue de Grenelle, Paris.
- GERMANY: Amerika-Institut, Berlin, N. W. 7.
- GREAT BRITAIN AND IRELAND: MESSRS. William Wesley & Son, 28 Essex Street, Strand, London.
- GREECE: Bibliothèque Nationale, Athens.
- GREENLAND, *via* Denmark.
- GUADELOUPE, *via* France.
- GUATEMALA: Instituto Nacional de Varones, Guatemala.
- GUINEA, *via* Portugal.
- HAITI: Secrétaire d'État des Relations Extérieures, Port au Prince.
- HONDURAS: Biblioteca Nacional, Tegucigalpa.
- HUNGARY: Dr. Julius Pikler, Municipal Office of Statistics, Váci-utca 80, Budapest.
- ICELAND, *via* Denmark.
- INDIA: India Store Department, India Office, London.
- ITALY: Ufficio degli Scambi Internazionali, Biblioteca Nazionale Vittorio Emanuele, Rome.
- JAMAICA: Institute of Jamaica, Kingston.
- JAPAN: Imperial Library of Japan, Tokyo.
- JAVA, *via* Netherlands.
- KOREA: His Imperial Japanese Majesty's Residency-General, Seoul.
- LIBERIA: Bureau of Exchanges, Department of State, Monrovia.
- LOURENÇO MARQUEZ: Government Library, Lourenço Marquez.
- LUXEMBURG, *via* Germany.
- MADAGASCAR, *via* France.
- MADEIRA, *via* Portugal.
- MONTENEGRO: Ministère des Affaires Étrangères, Cetinje.
- MOZAMBIQUE, *via* Portugal.
- NETHERLANDS: Bureau Scientifique Central Néerlandais, Bibliothèque de l'Université, Leyden.
- NEW GUINEA, *via* Netherlands.
- NEW SOUTH WALES: Public Library of New South Wales, Sydney.
- NEW ZEALAND: Dominion Museum, Wellington.
- NICARAGUA: Ministerio de Relaciones Exteriores, Managua.
- NORWAY: Kongelige Norske Frederiks Universitet Bibliotheket, Christiania.
- PANAMA: Secretaria de Relaciones Exteriores, Panama.
- PARAGUAY: Ministerio de Relaciones Exteriores, Asuncion.
- PERSIA: Board of Foreign Missions of the Presbyterian Church, New York City.
- PERU: Oficina de Reparto, Depósito y Canje Internacional de Publicaciones, Ministerio de Fomento, Lima.
- PORTUGAL: Serviço de Permutações Internacionais, Bibliotheca Nacional, Lisbon.
- QUEENSLAND: Bureau of Exchanges of International Publications, Chief Secretary's Office, Brisbane.
- ROUMANIA: Academia Romana, Bucharest.
- RUSSIA: Commission Russe des Échanges Internationaux, Bibliothèque Impériale Publique, St. Petersburg.
- SALVADOR: Ministerio de Relaciones Exteriores, San Salvador.

- SERVIA: Section Administrative du Ministère des Affaires Étrangères, Belgrade.  
 SIAM: Department of Foreign Affairs, Bangkok.  
 SOUTH AUSTRALIA: Public Library of South Australia, Adelaide.  
 SPAIN: Servicio del Cambio Internacional de Publicaciones, Cuerpo Facultativo de Archiveros, Bibliotecarios y Arqueólogos, Madrid.  
 SUMATRA, *via* Netherlands.  
 SWEDEN: Kongliga Svenska Vetenskaps Akademien, Stockholm.  
 SWITZERLAND: Service des Échanges Internationaux, Bibliothèque Fédérale Centrale, Berne.  
 SYRIA: Board of Foreign Missions of the Presbyterian Church, New York.  
 TASMANIA: Secretary to the Premier, Hobart.  
 TRINIDAD: Royal Victoria Institute of Trinidad and Tobago, Port-of-Spain.  
 TUNIS, *via* France.  
 TURKEY: American Board of Commissioners for Foreign Missions, Boston.  
 UNION OF SOUTH AFRICA: Government Printing Works, Pretoria, Transvaal.  
 URUGUAY: Oficina de Canje Internacional, Montevideo.  
 VENEZUELA: Biblioteca Nacional, Caracas.  
 VICTORIA: Public Library of Victoria, Melbourne.  
 WESTERN AUSTRALIA: Public Library of Western Australia, Perth.  
 WINDWARD AND LEEWARD ISLANDS: Imperial Department of Agriculture, Bridgetown, Barbados.

It is my sad duty to record here the death on June 25, 1914, of Dr. F. W. True, the Assistant Secretary in charge of Library and Exchanges. Dr. True was in charge of the exchanges a little over three years, having been appointed June 11, 1911. His official connection with the Institution, however, dates from 1881. During his incumbency Dr. True took special steps to increase the efficiency of the Exchange Service. Recently he addressed communications to the chiefs of the various foreign exchange bureaus and establishments acting as distributing agencies, requesting them to furnish him with certain statistical information regarding the exchanges carried on under their supervision for use in connection with the preparation of an article on the present condition of the International Exchange Service throughout the world which he had under way.

Respectfully submitted.

C. W. SHOEMAKER,

*Chief Clerk International Exchange Service.*

DR. CHARLES D. WALCOTT,

*Secretary of the Smithsonian Institution.*

AUGUST 5, 1914.

## APPENDIX 4.

### REPORT ON THE NATIONAL ZOOLOGICAL PARK.

SIR: I have the honor to submit herewith a report concerning the operation of the National Zoological Park during the fiscal year ending June 30, 1914.

By the sundry civil act approved June 23, 1913, Congress allowed \$100,000 for improvement and maintenance. The cost of food for the animals during the year was \$23,200, an increase of about \$3,000; considerable repairs were required to some of the older buildings, and a large amount of damage on the grounds was done by a heavy storm. The amount remaining available for improvement and expansion therefore was proportionately reduced.

#### ACCESSIONS.

The most important accessions were a male hippopotamus, a pair of young Bengal tigers, a pair of young lions, a sable antelope, and an American white crane. The animals mentioned in the last annual report as on their way from the Government Zoological Garden at Giza, Egypt, arrived early in the present fiscal year. Among them were a pair of young African elephants and a pair of cheetahs. The total expended for the purchase and transportation of animals was \$7,450, which includes \$1,900 paid for bringing over the animals from Giza.

Mammals and birds were born and hatched in the park to the number of 95, including bears of four species, an otter, five mink, several monkeys, a llama, a chamois, an Arabian gazelle, various deer, two American white pelicans, and some other mammals and birds.

#### EXCHANGES.

Comparatively few exchanges were made during the year. Among animals obtained by this means were a leopard, a Japanese bear, a white-tailed gnu, several other mammals, and a few birds and large snakes.

#### GIFTS.

- Miss M. H. Berger, Washington, D. C., an alligator.
- Mr. Walter Brown, Washington, D. C., a broad-winged hawk.
- Dr. D. E. Buckingham, Washington, D. C., a coyote.



Mrs. Charlotte Buford, Washington, D. C., a red-fronted parrot.  
 Mrs. M. E. Butler, Washington, D. C., a Belgian hare.  
 Mr. Walter Campbell, Alexandria, Va., a woodchuck.  
 Mrs. C. E. Clark, Washington, D. C., a finch.  
 Mrs. Thomas W. Coskery, Flemingsburg, Ky., a bald eagle.  
 Mrs. Ida M. Dalton, Washington, D. C., a broad-winged hawk.  
 Miss Elizabeth Eccleston, Forest Glen, Md., a common ferret.  
 Lieut. J. H. Everson, United States Navy, a roseate spoonbill.  
 Mr. W. L. Field, Washington, D. C., a Gila monster.  
 Capt. S. S. Flower, Giza, Egypt, an Arabian baboon.  
 Mrs. Elsie Frizzell, Washington, D. C., an American magpie.  
 Mr. F. P. Hall, Washington, D. C., a muscovy duck.  
 Mr. Hugh G. Harp, Bluemont, Va., a Cooper's hawk.  
 Mr. Hendley, Washington, D. C., a brown capuchin.  
 Mrs. C. B. Hight, Washington, D. C., an alligator.  
 Miss Barbara Hubbard, Washington, D. C., three common canaries.  
 Mrs. Hughes, Washington, D. C., a goldfinch.  
 Mr. C. E. Hunt, Washington, D. C., a cardinal and four doves.  
 Mrs. Lieber, Philadelphia, Pa., an alligator.  
 Miss Annie C. Linn, Alexandria, Va., a raccoon.  
 Asst. Paymaster Stanley Mathes, United States Navy, a paca.  
 Miss Maria I. McCormack, Washington, D. C., a Cuban parrot.  
 Mr. E. B. McLean, Washington, D. C., a peafowl.  
 Mr. Mills, Washington, D. C., a common canary.  
 Mr. A. M. Nicholson, Orlando, Fla., 12 young water moccasins.  
 Mr. R. G. Payne, Washington, D. C., a hog-nosed snake.  
 Mr. W. W. Reese, Ironton, Va., a bittern.  
 Mr. Peter Simon, Washington, D. C., a hog-nosed snake.  
 Mr. J. T. Smoot, Smoot, W. Va., a horned owl.  
 Mr. Andreas Soto, Cape San Antonio, Cuba, two white-headed doves.  
 Hon. William J. Stone, United States Senate, a raccoon.  
 Mr. F. A. Thackery, Sacaton, Ariz., a spotted lynx, two Gila monsters, and a horned lizard.  
 Mr. H. W. Wheeler, Street, Md., a black snake.  
 Hon. Woodrow Wilson, Washington, D. C., three opossums.  
 Unknown donor, a pigeon hawk.

## LOSSES.

The losses were distributed throughout the collection, the more important being a lion, a cougar, a guanaco, a gazelle, and an Arabian baboon which died from pneumonia; an East African buffalo, a gnu, a mandrill, and a Malay bear from tuberculosis; two lions, a tiger, a moose, and an American bison from gastritis and enteritis; a rhea, a sarus crane, a flamingo, and a great bustard from aspergillosis; and several mammals and birds as the result of fighting and accidents. A number of birds were killed by predatory animals living at large in the park.

Such of the dead animals as were of value for study or for other museum purposes were transferred to the National Museum to the number of 88. Autopsies were made, as usual, by the Pathological

Division of the Bureau of Animal Industry, Department of Agriculture.<sup>1</sup>

## ANIMALS IN THE COLLECTION JUNE 30, 1914.

## MAMMALS.

Green monkey ( <i>Cercopithecus callitrichus</i> )	1	Gray wolf ( <i>Canis occidentalis</i> )	4
Mona monkey ( <i>Cercopithecus mona</i> )	2	Coyote ( <i>Canis latrans</i> )	4
Diana monkey ( <i>Cercopithecus diana</i> )	1	Woodhouse's coyote ( <i>Canis frustror</i> )	3
Sooty mangabey ( <i>Cercocebus fuliginosus</i> )	1	Red fox ( <i>Vulpes pennsylvanicus</i> )	5
Bonnet monkey ( <i>Macacus sinicus</i> )	1	Swift fox ( <i>Vulpes velox</i> )	2
Macaque monkey ( <i>Macacus cynomolgus</i> )	2	Arctic fox ( <i>Vulpes lagopus</i> )	1
Pig-tailed monkey ( <i>Macacus nemestrinus</i> )	5	Gray fox ( <i>Urocyon cinereo-argenteus</i> )	5
Rhesus monkey ( <i>Macacus rhesus</i> )	15	Spotted hyena ( <i>Hyæna crocuta</i> )	1
Brown macaque ( <i>Macacus arctoides</i> )	3	African palm civet ( <i>Viverra civetta</i> )	1
Japanese monkey ( <i>Macacus fuscatus</i> )	3	Common genet ( <i>Genetta genetta</i> )	2
Black ape ( <i>Cynopithecus niger</i> )	1	Cheetah ( <i>Cynailurus jubatus</i> )	2
Chacma ( <i>Papio porcarius</i> )	1	Sudan lion ( <i>Felis leo</i> )	3
Hamadryas baboon ( <i>Papio hamadryas</i> )	3	Kilimanjaro lion ( <i>Felis leo sabakiensis</i> )	2
Mandrill ( <i>Papio maimon</i> )	1	Tiger ( <i>Felis tigris</i> )	2
Gray spider monkey ( <i>Ateles geoffroyi</i> )	1	Cougar ( <i>Felis oregonensis hippolestes</i> )	1
White-throated capuchin ( <i>Cebus hypoleucus</i> )	1	Jaguar ( <i>Felis onca</i> )	1
Brown monkey ( <i>Cebus fatuellus</i> )	1	Leopard ( <i>Felis pardus</i> )	3
Durukuli ( <i>Nyctipithecus trivirgatus</i> )	1	Black leopard ( <i>Felis pardus</i> )	1
Mongoose lemur ( <i>Lemur mongoz</i> )	1	Canada lynx ( <i>Lynx canadensis</i> )	1
Ring-tailed lemur ( <i>Lemur catta</i> )	2	Bay lynx ( <i>Lynx rufus</i> )	8
Garnett's galago ( <i>Galago garnetti</i> )	1	Spotted lynx ( <i>Lynx rufus texensis</i> )	2
Polar bear ( <i>Thalarctos maritimus</i> )	2	Florida lynx ( <i>Lynx rufus floridanus</i> )	1
European brown bear ( <i>Ursus arctos</i> )	2	Steller's sea lion ( <i>Eumetopias stelleri</i> )	1
Kadiak bear ( <i>Ursus middendorffi</i> )	1	California sea lion ( <i>Zalophus californianus</i> )	2
Yakutat bear ( <i>Ursus dalli</i> )	1	Northern fur seal ( <i>Callotaria alascanus</i> )	1
Alaskan brown bear ( <i>Ursus gyas</i> )	3	Harbor seal ( <i>Phoca vitulina</i> )	2
Kidder's bear ( <i>Ursus kidderi</i> )	2	Fox squirrel ( <i>Sciurus niger</i> )	9
Himalayan bear ( <i>Ursus thibetanus</i> )	1	Western fox squirrel ( <i>Sciurus ludovicianus</i> )	8
Japanese bear ( <i>Ursus japonicus</i> )	1	Gray squirrel ( <i>Sciurus carolinensis</i> )	40
Grizzly bear ( <i>Ursus horribilis</i> )	3	Black squirrel ( <i>Sciurus carolinensis</i> )	20
Black bear ( <i>Ursus americanus</i> )	9	Albino squirrel ( <i>Sciurus carolinensis</i> )	1
Cinnamon bear ( <i>Ursus americanus</i> )	2	Prairie dog ( <i>Cynomys ludovicianus</i> )	54
Sloth bear ( <i>Melursus ursinus</i> )	1	Albino woodchuck ( <i>Arctomys monax</i> )	1
Kinkajou ( <i>Cercoleptes caudivolvulus</i> )	1	Alpine marmot ( <i>Arctomys marmotta</i> )	1
Cacomistle ( <i>Bassariscus astuta</i> )	1	American beaver ( <i>Castor canadensis</i> )	6
Raccoon ( <i>Procyon lotor</i> )	10	Hutia-conga ( <i>Capromys pilorides</i> )	1
American badger ( <i>Taxidea taxus</i> )	3	Indian porcupine ( <i>Hystrix leucura</i> )	2
Common skunk ( <i>Mephitis putida</i> )	4	Canada porcupine ( <i>Erethizon dorsatus</i> )	1
American marten ( <i>Mustela americana</i> )	4	Canada porcupine ( <i>Erethizon dorsatus</i> ) albino	1
Fisher ( <i>Mustela pennanti</i> )	1	Mexican agouti ( <i>Dasyprocta mexicana</i> )	1
Mink ( <i>Putorius vison</i> )	13	Azara's agouti ( <i>Dasyprocta azarae</i> )	2
Common ferret ( <i>Putorius putorius</i> )	1	Crested agouti ( <i>Dasyprocta cristata</i> )	2
Black-footed ferret ( <i>Putorius nigripes</i> )	1	Hairy-rumped agouti ( <i>Dasyprocta prymnolopha</i> )	2
North American otter ( <i>Lutra canadensis</i> )	2	Paca ( <i>Catogenys paca</i> )	3
Eskimo dog ( <i>Canis familiaris</i> )	13	Guinea pig ( <i>Cavia cutleri</i> )	13
Dingo ( <i>Canis dingo</i> )	1	Patagonian cavy ( <i>Dolichotis patagonica</i> )	1
		Capybara ( <i>Hydrochærus capybara</i> )	1
		Domestic rabbit ( <i>Lepus cuniculus</i> )	15

<sup>1</sup> The causes of death were reported to be as follows: Enteritis, 23; gastritis, 2; gastroenteritis, 2; pneumonia, 15; pleuropneumonia, 1; congestion of lungs, 2; tuberculosis, 10; aspergilliosis, 4; septicemia, 2; congestion of liver, 1; rupture of heart, 1; impaction of gall bladder and ducts, 1; impaction of stomach with stones, 1; tumor, 1; purulent conjunctivitis, 1; cataract, 1; congelation, 1; anæmia due to old age, 2; accident, 3; and undetermined, 4.

## Animals in the collection June 30, 1914—Continued.

## MAMMALS—Continued.

Cape hyrax ( <i>Procavia capensis</i> )-----	2	Prong-horn antelope ( <i>Antilocapra americana</i> )-----	2
African elephant ( <i>Elephas oryotis</i> )----	2	Coke's hartebeest ( <i>Bubalis cokei</i> )-----	1
Indian elephant ( <i>Elephas maximus</i> )----	1	Blessbok ( <i>Damaliscus albifrons</i> )-----	1
Brazilian tapir ( <i>Tapirus americanus</i> )----	4	White-tailed gnu ( <i>Connochætes gnu</i> )-----	1
Grevy's zebra ( <i>Equus grevyi</i> )-----	2	Defassa water buck ( <i>Cobus defassa</i> )----	1
Zebra-horse hybrid ( <i>Equus grevyi-ca-ballus</i> )-----	1	Indian Antelope ( <i>Antilope cervicapra</i> )--	3
Zebra-donkey hybrid ( <i>Equus grevyi-asinus</i> )-----	1	Dorcas gazelle ( <i>Gazella dorcas</i> )-----	1
Grant's zebra ( <i>Equus burchelli granti</i> )--	1	Arabian gazelle ( <i>Gazella arabica</i> )-----	4
Collared peccary ( <i>Dicotyles angulatus</i> )	3	Sable antelope ( <i>Hippotragus niger</i> )----	1
Wild boar ( <i>Sus scrofa</i> )-----	1	Nilgai ( <i>Boselaphus tragocamelus</i> )-----	3
Northern wart hog ( <i>Phacochoærus africanus</i> )-----	2	Congo harnessed antelope ( <i>Tragelaphus gratus</i> )-----	2
Hippopotamus ( <i>Hippopotamus amphibius</i> )-----	2	Chamois ( <i>Rupicapra tragus</i> )-----	3
Guanaco ( <i>Lama huanachus</i> )-----	2	Tahr ( <i>Hemitragus jemlaicus</i> )-----	4
Llama ( <i>Lama glama</i> )-----	7	Common goat ( <i>Capra hircus</i> )-----	6
Alpaca ( <i>Lama pacos</i> )-----	2	Angora goat ( <i>Capra hircus</i> )-----	2
Vicugna ( <i>Lama vicugna</i> )-----	3	Circassian goat ( <i>Capra hircus</i> )-----	4
Bactrian camel ( <i>Camelus bactrianus</i> )----	2	Barbary sheep ( <i>Ovis tragelaphus</i> )-----	12
Arabian camel ( <i>Camelus dromedarius</i> )----	3	Barbados sheep ( <i>Ovis aries-tragelaphus</i> )-----	10
Sambar deer ( <i>Cervus aristotelis</i> )-----	3	Anoa ( <i>Anoa depressicornis</i> )-----	1
Philippine deer ( <i>Cervus philippinus</i> )----	1	Zebu ( <i>Bibos indicus</i> )-----	3
Hog deer ( <i>Cervus porcinus</i> )-----	7	Yak ( <i>Poëphagus grunniens</i> )-----	5
Barasingha deer ( <i>Cervus duvaucelii</i> )----	12	American bison ( <i>Bison americanus</i> )-----	16
Axis deer ( <i>Cervus axis</i> )-----	8	Hairy armadillo ( <i>Dasyops villosus</i> )-----	3
Japanese deer ( <i>Cervus sika</i> )-----	19	Wallaroo ( <i>Macropus robustus</i> )-----	3
Red deer ( <i>Cervus elaphus</i> )-----	7	Red kangaroo ( <i>Macropus rufus</i> )-----	2
American elk ( <i>Cervus canadensis</i> )-----	8	Red-necked wallaby ( <i>Macropus ruficollis</i> )-----	1
Fallow deer ( <i>Cervus dama</i> )-----	4	Virginia opossum ( <i>Didelphys marsupialis</i> )-----	3
Virginia deer ( <i>Odocoileus virginianus</i> )	11	Virginia opossum ( <i>Didelphys marsupialis</i> ) albino-----	1
Mule deer ( <i>Odocoileus hemionus</i> )-----	1	Common wombat ( <i>Phascotomys mitchelli</i> )-----	1
Columbian black-tailed deer ( <i>Odocoileus columbianus</i> )-----	1		
Cuban deer ( <i>Odocoileus sp.</i> )-----	1		

## BIRDS.

Catbird ( <i>Dumetella carolinensis</i> )-----	2	Whydah weaver ( <i>Vidua paradisæa</i> )----	27
Brown thrasher ( <i>Toxostoma rufum</i> )----	1	Red-crested cardinal ( <i>Paroaria cucullata</i> )-----	8
Japanese robin ( <i>Liothrix luteus</i> )-----	7	Rose-breasted grosbeak ( <i>Zamelodia ludoviciana</i> )-----	1
Laughing thrush ( <i>Garrulax leucolophus</i> )-----	2	Common cardinal ( <i>Cardinalis cardinalis</i> )-----	2
Bishop finch ( <i>Tanagra episcopus</i> )-----	4	Siskin ( <i>Spinus spinus</i> )-----	5
Cut-throat finch ( <i>Amadina fasciata</i> )----	8	Saffron finch ( <i>Sycalis flaveola</i> )-----	19
Zebra finch ( <i>Amadina castanotis</i> )-----	4	Yellow-hammer ( <i>Emberiza citrinella</i> )----	1
Black-headed finch ( <i>Munia atricapilla</i> )-----	6	Common canary ( <i>Serinus canarius</i> )----	26
Three-colored finch ( <i>Munia malacca</i> )----	6	Linnet ( <i>Linota cannabina</i> )-----	4
White-headed finch ( <i>Munia maja</i> )-----	9	Cowbird ( <i>Molothrus ater</i> )-----	1
Nutmeg finch ( <i>Munia punctularia</i> )----	6	Meadow lark ( <i>Sturnella magna</i> )-----	2
Java sparrow ( <i>Munia oryzivora</i> )-----	13	Glossy starling ( <i>Lamprotornis caudatus</i> )-----	1
White Java sparrow ( <i>Munia oryzivora</i> )-----	12	Malabar mynah ( <i>Poliopsar malabarius</i> )-----	2
Sharp-tailed grass finch ( <i>Poëphila acuticauda</i> )-----	1	European raven ( <i>Corvus corax</i> )-----	1
Silver-bill finch ( <i>Aidemosyne cantans</i> )----	4	American raven ( <i>Corvus corax sinuatus</i> )-----	2
Chestnut-breasted finch ( <i>Donacola castaneothorax</i> )	6	Common crow ( <i>Corvus brachyrhynchos</i> )-----	1
Napolean weaver ( <i>Pyromelana afra</i> )----	4	Green jay ( <i>Xanthoura luxuosa</i> )-----	1
Madagascar weaver ( <i>Foudia madagascariensis</i> )-----	4	White-throated jay ( <i>Garrulus leucotis</i> )--	2
Red-billed weaver ( <i>Quelea quelea</i> )-----	8		

## Animals in the collection June 30, 1914—Continued.

## BIRDS—Continued.

Blue jay ( <i>Cyanocitta cristata</i> )-----	3	Chillan eagle ( <i>Geranoaëtus melano-</i>	
American magpie ( <i>Pica pica hudsonica</i> )--	3	leucus)-----	1
Red-billed magpie ( <i>Urocissa occipi-</i>		Crowned hawk eagle ( <i>Spizaëtus coron-</i>	
talis)-----	2	atus)-----	1
Piping crow ( <i>Gymnorhina tibicen</i> )----	1	Broad-winged hawk ( <i>Buteo platyp-</i>	
Giant kingfisher ( <i>Dacelo gigas</i> )-----	3	terus)-----	1
Sulphur-crested cockatoo ( <i>Cacatua ga-</i>		Swainson's hawk ( <i>Buteo swainsoni</i> )--	1
berita)-----	3	Venezuelan hawk-----	1
White cockatoo ( <i>Cacatua alba</i> )-----	6	Caracara ( <i>Polyborus cheriway</i> )-----	3
Leadbeater's cockatoo ( <i>Cacatua lead-</i>		Lammergeyer ( <i>Gypaëtus barbatus</i> )----	1
beateri)-----	1	South American condor ( <i>Sarcorham-</i>	
Bare-eyed cockatoo ( <i>Cacatua gym-</i>		phus gryphus)-----	1
nopsis)-----	4	California condor ( <i>Gymnogyps califor-</i>	
Roseate cockatoo ( <i>Cacatua roseica-</i>		niamus)-----	3
pilla)-----	12	Griffon vulture ( <i>Gyps fulvus</i> )-----	2
Cockateel ( <i>Calopsittacus nova-hol-</i>		Cinereous vulture ( <i>Vultur monachus</i> )--	2
landiæ)-----	2	Egyptian vulture ( <i>Neophron percnop-</i>	
Yellow and blue macaw ( <i>Ara ara-</i>		terus)-----	1
rauna)-----	2	Turkey vulture ( <i>Cathartes aura</i> )-----	4
Red and yellow and blue macaw ( <i>Ara</i>		Black vulture ( <i>Catharista urubi</i> )-----	2
macao)-----	6	King vulture ( <i>Gypagus papa</i> )-----	2
Red and blue macaw ( <i>Ara chloroptera</i> )	2	Red-billed pigeon ( <i>Columba flaviros-</i>	
Great green macaw ( <i>Ara militaris</i> )-----	1	tris)-----	4
Mexican conure ( <i>Conurus holochlorus</i> )--	1	White-crowned pigeon ( <i>Columba leuco-</i>	
Gray-breasted parrakeet ( <i>Myopsittacus</i>		cephala)-----	2
monachus)-----	3	Band-tailed pigeon ( <i>Columba fasciata</i> )--	4
Cuban parrot ( <i>Amazona leucocephala</i> )--	3	Mourning dove ( <i>Zenaidura macroura</i> )--	7
Orange-winged amazon ( <i>Amazona</i>		Peaceful dove ( <i>Geopelia tranquilla</i> )----	2
amazonica)-----	1	Collared turtle dove ( <i>Turtur risorius</i> )--	13
Festive amazon ( <i>Amazona festiva</i> )----	1	Cape masked dove ( <i>Aena capensis</i> )-----	5
Porto Rican amazon ( <i>Amazona vit-</i>		Nicaraguan pigeon ( <i>Catalenas nicobarica</i> )--	2
tata)-----	1	Barred curassow ( <i>Crao fasciolata</i> )----	1
Yellow-shouldered amazon ( <i>Amazona</i>		Wild turkey ( <i>Meleagris gallopavo sil-</i>	
ochroptera)-----	2	vestris)-----	8
Yellow-fronted amazon ( <i>Amazona</i>		Peafowl ( <i>Pavo cristata</i> )-----	80
ochrocephala)-----	2	Jungle fowl ( <i>Gallus bankiva</i> )-----	1
Red-fronted amazon ( <i>Amazona rhodo-</i>		English pheasant ( <i>Phasianus colchi-</i>	
corytha)-----	1	cus)-----	1
Yellow-headed amazon ( <i>Amazona ic-</i>		European quail ( <i>Coturnix communis</i> )--	1
raillanti)-----	2	Massena quail ( <i>Cyrtonyx montezumæ</i> )--	4
Blue-fronted amazon ( <i>Amazona</i>		Black-backed gallinule ( <i>Porphyrio mel-</i>	
æstiva)-----	2	notus)-----	1
Lesser vasa parrot ( <i>Coracopsis nigra</i> )--	2	American coot ( <i>Fulica americana</i> )-----	5
Banded parrakeet ( <i>Palæornis fasciata</i> )--	1	Flightless rail ( <i>Ocydromus australis</i> )--	1
Alexandrine parrakeet ( <i>Palæornis alex-</i>		Great bustard ( <i>Otis tarda</i> )-----	1
andri)-----	2	Common curassow ( <i>Cariama cristata</i> )--	1
Love bird ( <i>Agapornis pullaria</i> )-----	1	Demoiselle crane ( <i>Anthropoides virgo</i> )--	6
Green parrakeet ( <i>Loriculus</i> sp.)-----	2	Crowned crane ( <i>Balearica pavonina</i> )--	2
Shell parrakeet ( <i>Melopsittacus un-</i>		Whooping crane ( <i>Grus americana</i> )-----	1
dulatus)-----	4	Sandhill crane ( <i>Grus mexicana</i> )-----	2
Great horned owl ( <i>Bubo virginianus</i> )--	11	Australian crane ( <i>Grus australasiana</i> )--	1
Arctic horned owl ( <i>Bubo virginianus</i>		European crane ( <i>Grus cinerea</i> )-----	1
subarcticus)-----	1	Indian white crane ( <i>Grus leucogera-</i>	
Screech owl ( <i>Otus asio</i> )-----	3	nus)-----	2
Barred owl ( <i>Strix varia</i> )-----	2	Ruff ( <i>Machetes pugnax</i> )-----	2
Barn owl ( <i>Aluco pratincola</i> )-----	1	Black-crowned night heron ( <i>Nycticorax</i>	
Sparrow hawk ( <i>Falco sparverius</i> )-----	1	nycticorax nævius)-----	8
Bald eagle ( <i>Haliaeetus leucocephalus</i> )--	8	Snowy egret ( <i>Egretta candidissima</i> )--	3
Alaskan bald eagle ( <i>Haliaeetus leucoc-</i>		Great white heron ( <i>Herodias egretta</i> )--	1
phalus alascanus)-----	1	Great blue heron ( <i>Ardea herodias</i> )-----	3
Golden eagle ( <i>Aquila chrysaëtus</i> )-----	4	Great black-crowned heron ( <i>Ardea co-</i>	
Harp eagle ( <i>Thrasaëtus harpyia</i> )-----	1	coi)-----	1
		Boat-bill ( <i>Canceroma cochlearia</i> )-----	2

## Animals in the collection June 30, 1914—Continued.

## BIRDS—Continued.

Black stork ( <i>Ciconia nigra</i> )-----	1	Mandarin duck ( <i>Dendronessa galeri-</i>	
Marabou stork ( <i>Leptoptilus dubius</i> )---	1	<i>culata</i> )-----	5
Wood ibis ( <i>Mycteria americana</i> )-----	2	Pintail ( <i>Dafila acuta</i> )-----	4
Sacred ibis ( <i>Ibis aethiopica</i> )-----	3	Shoveler duck ( <i>Spatula clypeata</i> )-----	1
White ibis ( <i>Guara alba</i> )-----	18	Black duck ( <i>Anas rubripes</i> )-----	3
Roseate spoonbill ( <i>Ajaja ajaja</i> )-----	2	Mallard ( <i>Anas platyrhynchos</i> )-----	13
European flamingo ( <i>Phaenicopterus ro-</i>		American white pelican ( <i>Pelecanus</i>	
<i>seus</i> )-----	5	<i>erythrorhynchos</i> )-----	9
Whistling swan ( <i>Olor columbianus</i> )---	5	European white pelican ( <i>Pelecanus</i>	
Mute swan ( <i>Cygnus gibbus</i> )-----	7	<i>onocrotalus</i> )-----	1
Black swan ( <i>Chenopsis atrata</i> )-----	1	Roseate pelican ( <i>Pelecanus roseus</i> )---	1
Muscovy duck ( <i>Cairina moschata</i> )---	2	Brown pelican ( <i>Pelecanus occidentalis</i> )	5
White muscovy duck ( <i>Cairina mos-</i>		Australian pelican ( <i>Pelecanus con-</i>	
<i>chata</i> )-----	2	<i>spicillatus</i> )-----	2
Wandering tree-duck ( <i>Dendrocygna</i>		Florida cormorant ( <i>Phalacrocorax au-</i>	
<i>arcuata</i> )-----	6	<i>ritus floridanus</i> )-----	13
Fulvous tree-duck ( <i>Dendrocygna bi-</i>		Mexican cormorant ( <i>Phalacrocorax</i>	
<i>color</i> )-----	2	<i>vigua mexicanus</i> )-----	1
Brant ( <i>Branta bernicla glaucogastra</i> )--	1	Water turkey ( <i>Anhinga anhinga</i> )-----	2
Canada goose ( <i>Branta canadensis</i> )---	7	American herring gull ( <i>Larus argen-</i>	
Hutchins's goose ( <i>Branta canadensis</i>		<i>tatus smithsonianus</i> )-----	3
<i>hutchinsii</i> )-----	3	Laughing gull ( <i>Larus atricilla</i> )-----	2
Lesser snow goose ( <i>Chen hyperboreus</i> )	1	South African ostrich ( <i>Struthio aus-</i>	
Greater snow goose ( <i>Chen hyperboreus</i>		<i>tralis</i> )-----	7
<i>navalis</i> )-----	1	Somali ostrich ( <i>Struthio molybdo-</i>	
American white-fronted goose ( <i>Anser</i>		<i>phanes</i> )-----	1
<i>albifrons gambeli</i> )-----	1	Common cassowary ( <i>Casuarus galea-</i>	
Chinese goose ( <i>Anser cygnoides</i> )-----	3	<i>tus</i> )-----	1
Scap duck ( <i>Marila marila</i> )-----	5	Common rhea ( <i>Rhea americana</i> )-----	2
Red-headed duck ( <i>Marila americana</i> )--	2	Emu ( <i>Dromæus novæ hollandiæ</i> )-----	2
Wood duck ( <i>Aix sponsa</i> )-----	5		

## REPTILES.

Alligator ( <i>Alligator mississippiensis</i> )--	20	Spreading adder ( <i>Heterodon platy-</i>	
Painted box-tortoise ( <i>Cistudo ornata</i> )--	2	<i>rhinus</i> )-----	1
Duncan Island tortoise ( <i>Testudo ephip-</i>		Black snake ( <i>Zamenis constrictor</i> )---	1
<i>pium</i> )-----	2	Water snake ( <i>Natrix sipedon</i> )-----	3
Albemarle Island tortoise ( <i>Testudo</i>		Common garter snake ( <i>Eutania sirtalis</i> )	1
<i>vicina</i> )-----	1	Water moccasin ( <i>Ancistrodon pis-</i>	
Horned lizard ( <i>Phrynosoma cornutum</i> )	1	<i>civorus</i> )-----	9
Gila monster ( <i>Heloderma suspectum</i> )--	4	Copperhead ( <i>Ancistrodon contortrix</i> )--	1
Regal python ( <i>Python reticulatus</i> )---	4	Diamond rattlesnake ( <i>Crotalus ada-</i>	
Common boa ( <i>Boa constrictor</i> )-----	2	<i>manteus</i> )-----	4
Anaconda ( <i>Eunectes murinus</i> )-----	1	Banded rattlesnake ( <i>Crotalus horridus</i> )	1
Velvet snake ( <i>Epicrates cenchris</i> )-----	3		

## STATEMENT OF THE COLLECTION.

## ACCESSIONS DURING THE YEAR.

Presented-----	59
Purchased-----	120
Born and hatched in the National Zoological Park-----	95
Received in exchange-----	17
Deposited in National Zoological Park-----	30
Captured in National Zoological Park-----	4
Total-----	325

## SUMMARY.

Animals on hand July 1, 1913.....	1,468
Accessions during the year.....	325
	1,793
Deduct loss (by exchange, death, return of animals, etc.).....	431
On hand June 30, 1914.....	1,362

Class.	Species.	Individuals.
Mammals.....	150	604
Birds.....	172	697
Reptiles.....	18	61
Total.....	340	1,362

The number of animals on hand at the close of this year was about 100 less than the previous year. This decrease occurred mainly in small birds, conditions in the temporary bird house being so unsatisfactory that it seemed advisable to reduce somewhat that part of the collection. The floor of the bird house had to be renewed and the underpinning replaced and made rat proof.

Fewer reptiles, also, were on hand, as a part of the space previously used for them in the lion house was required for the new hippopotamus.

## VISITORS.

The number of visitors to the park during the year, as determined by count and estimate, was 733,277, a daily average of 2,009. This was about 100,000 more than during the previous fiscal year. The largest number in any one month was 142,491, in April, 1914. The largest number during one day was 56,981, on April 13 (Easter Monday). Vehicles were excluded from 10 a. m. to 5 p. m. of that day because of the crowded condition of the roads.

Seventy-nine schools, classes, etc., visited the park, with a total of 3,172 individuals.

## IMPROVEMENTS.

The amount remaining from the appropriation, after providing for maintenance and the acquisition of animals already mentioned, was used for such minor improvements as were most urgently needed. The fitting up of the old elephant barn as temporary quarters for the pair of African elephants was completed, and a good-sized yard built in connection with it, inclosed by a strong steel fence. The yard includes a bathing pool. The adjoining inclosure and pool for tapirs were completed and put in use early in the year.

New quarters for hippopotamus were arranged in the lion house by enlarging the cage formerly occupied by elephant seals. This

was already provided with a tank of sufficient size, and, by extending the exterior wall, ample floor space was secured. The female hippopotamus, which had outgrown her temporary quarters, was transferred to the new and much larger cage, and the cage vacated was used for a young male that had been obtained at an unusually favorable price. Both animals have access to the outdoor yard and the large pool which it contains. A new inclosure and shelter house for Arabian camels were built near the sheep and deer inclosures and two new yards were added to the series for wolves and foxes.

A yard 40 by 56 feet, with 10 breeding pens inclosed in it, was built to provide for the breeding and study of mink in cooperation with the Department of Agriculture.

During several years predatory animals living at large in the park had at times forced their way into the flying cage and caused considerable loss among the birds. In order to prevent this the guardrail about the cage was rebuilt, using between the posts a wire netting with small mesh and at the top a sheet-iron hood. This has proved to be effective against both rats and larger vermin.

A small temporary toilet for men was built near the entrance from Adams Mill Road.

A hot-water heating plant was installed in the office building, which had up to that time been heated, rather unsatisfactorily, with stoves. At the same time new floors were laid on the main floor of the office and some other much-needed repairs made. In order to provide for more convenient and economical use of the machines in the workshop, two additional electric motors were installed there.

The drinking fountains with attached cups were removed and seven "bubble" fountains set in their places. Several of these are fitted with faucets for the accommodation of visitors who bring cups or desire to obtain water for picnic purposes.

Two tennis courts were constructed in the lower end of the park where there is level ground that is not as yet available for other purposes.

The cost of these improvements was as follows:

Fitting up old elephant barn and building yard.....	\$1,325
Completing yard and pool for tapirs.....	300
New quarters for hippopotamus.....	650
Inclosure and shelter house for Arabian camels.....	390
Additional yards for wolves.....	400
Quarters for breeding mink.....	325
New guard rail, with foundation wall, at flying cage.....	750
Small toilet house for men.....	200
Heating plant and new floors in office building.....	950
Additional motors in workshop.....	350
"Bubble" drinking fountains.....	200
Two tennis courts.....	150

## MAINTENANCE OF BUILDINGS, INCLOSURES, GROUNDS, ETC.

Considerable repairs had to be made to some of the buildings and inclosures, including new roof covering on part of the lion house and the rebuilding of the fence around the elk paddock, and a portion of the retaining wall above the bear yards on the eastern side of the park was rebuilt where it had been undermined by the weathering of the rock below.

A severe storm on July 30, 1913, destroyed a number of large trees and caused serious damage throughout the park. The cost of removing the débris and restoring the park to its normal condition was about \$1,500.

## BRIDGE.

The construction of the "rough stone or boulder bridge" across Rock Creek, which was mentioned in the last annual report, proceeded in a satisfactory manner. The contract for the excavation and masonry work was secured by the lowest bidder, the Warren F. Brenizer Co. The plans and specifications were prepared by David E. McComb, engineer of bridges, District of Columbia, and it was thought best that the supervising engineer and the inspector of the work should be persons recommended by him. Mr. W. A. Draper was accordingly employed as engineer and Mr. William Champion as inspector. No obstacles of any importance were met with during the progress of the work, though it was found that the excavation required for the piers was somewhat greater than had been anticipated. The bridge was opened for travel on November 1, 1913. As there was a heavy fill of earth over the stone masonry, it was necessary to defer the construction of the macadam surface and concrete sidewalk until spring. This also was satisfactorily completed during June, 1914.

The following is a statement of the expenditures from the appropriation of \$20,000:

Expenditures prior to July 1, 1913 (all outside of contract for excavation and masonry)-----	\$1, 776
Total payments under contract-----	10, 914
Expenditures during this fiscal year (outside of contract)-----	5, 158

17, 848

Since the close of the fiscal year expenditures and liabilities have been incurred, amounting to \$335, for restoring and perfecting the approaches to the bridge. The total expenditures to date are therefore \$18,183.

## ALTERATION OF THE WEST BOUNDARY OF THE PARK.

The sundry civil act for the fiscal year ending June 30, 1914, contained the following item:

Readjustment of boundaries: For acquiring, by condemnation, all the lots, pieces, or parcels of land, other than the one hereinafter excepted, that lie



between the present western boundary of the National Zoological Park and Connecticut Avenue from Cathedral Avenue to Klinge Road, \$107,200, or such portion thereof as may be necessary, said land when acquired, together with the included highways, to be added to and become a part of the National Zoological Park. The proceedings for the condemnation of said land shall be instituted by the Secretary of the Treasury under and in accordance with the terms and provisions of subchapter 1 of chapter 15 of the Code of Law for the District of Columbia.

Under the sanction given by this act the attention of the Secretary of the Treasury was immediately called to the matter. A great delay has occurred. It is understood that a new survey of the property involved was necessary, that the searching of titles to the various parcels of land consumed considerable time. The case is now before the Supreme Court of the District of Columbia awaiting the award of a jury. In the meantime the principal property owner has endeavored to enhance the value of the land by grading and otherwise improving it. The total amount to be purchased is about  $10\frac{2}{3}$  acres.

#### ROCK CREEK MAIN INTERCEPTOR.

The District of Columbia having obtained from Congress authority to construct a large sewer, called the "Rock Creek main interceptor," extending from P Street northwest to the Military Road, District of Columbia, began work upon it within the limits of the park on June 1, 1913. The project involves both an open-cut sewer and a tunnel, about 2,000 feet in length, extending from a short distance below the new bridge to the Klinge Road. This construction necessarily produces a considerable disturbance of the surface and defacement of the natural features of the park. This is particularly the case at either end of the tunnel, where thousands of yards of excavated material have been dumped. It is hoped that the District officials will be able to remedy this in some measure when the work shall be completed. This is expected about September 5, 1914.

#### NEW APPROACH TO THE PARK.

By an act of Congress approved March 2, 1911, there was authorized a new approach to the park from Sixteenth Street and Columbia Road to what has been known as the Quarry Road entrance. This has now been completed by the District with a fine macadam roadway, and offers a most convenient and attractive route for reaching the park from the city. The Quarry Road, which had a very steep and dangerous gradient, has been abolished as a means of access.

#### IMPORTANT NEEDS.

*Aviary.*—Attention has been called for several years past to the importance of erecting a suitable house for the care and preserva-

tion of the birds of the collection, most of which are now housed in a low, wooden, temporary structure which is by no means suitable for the purpose and has to be constantly renewed by repairs. The matter has been repeatedly urged upon Congress and an appropriation of \$80,000 asked for a new structure. This is by no means an extravagant sum, as the aviaries of most zoological collections cost considerably more than this.

*Reptile house.*—The park has never had an adequate exhibition of the interesting and varied domain of reptiles. A few alligators, some Galapagos tortoises, boas, anacondas, and a few native species are kept in the lion house in quarters which are entirely unsuitable for their proper exhibition and comfort. It is thought that a proper reptile house, where the specimens could be kept in approximately natural conditions, could be built for about \$50,000.

*Pachyderm house.*—There are now in the collection a considerable number of pachydermata or thick-skinned animals, including an Indian elephant, two African elephants, two hippopotami, and four tapirs. These all require special treatment in the way of bathing pools, strong walls, etc. These animals are at present nearly all housed in quarters that are too small and weak. Some of them are young and rapidly growing and it will soon be a difficult matter to confine them. It is also likely that other species will be added to those now on hand. To properly exhibit and care for them a new house should be built. It is thought that this can be done at a cost of \$100,000, which is much less than similar structures have cost in other cities.

*Hospital and laboratory.*—The park has not at the present time any means for properly isolating and caring for the animals that may be injured or ailing. Sick animals are ordinarily exposed to the gaze of the public, to the detriment of the animals and the reputation of the park. Quiet and repose are as necessary to animals as to man, and that can not be assured under the present conditions.

Besides this, which seems required merely from humanitarian reasons, consideration should be given to certain scientific aspects of the matter. The diseases and parasites of animals are but imperfectly understood, and investigations of them are important, both directly and for their analogy with these of man and their possible transmission to the human race. The animals received at the park have usually been kept in unsanitary quarters and frequently bring in the germs of disease which they transmit to others. If a strict quarantine for a suitable time could be established this danger could be avoided in a great measure and the death rate reduced. Further than this there is now no adequate utilization of the animals for scientific purposes.

In other countries the most significant scientific function of collections of living animals has been the advancement of our knowledge with regard to the structure, habits, and activities of animals. Most of the knowledge which has been acquired with regard to the structure of animals has been gained from zoological collections of precisely similar character to those which we have in the National Zoological Park.

I may note, for example, that in the Jardin des Plantes, at Paris, investigations have been carried on since the middle of the eighteenth century by men who are among the most famous scientists that have ever lived. I will mention, among others, Duverney, Daubenton, Buffon, Cuvier, Geoffroy Saint-Hilaire, and Milne-Edwards. In the same way great names are associated with the Zoological Society of London. I may mention in this connection the names of Owen, Flower, Huxley, Selater, and the present prosector, Beddard. The garden at Berlin has been noted for the work of Hartmann, and in the garden at Amsterdam Fürbringer brought to a conclusion his monumental work upon the structure of birds. I mention a few names among many. It would be easy to extend the list very considerably.

In order to properly utilize the material that comes to the park from the death of the animals, it would be necessary to establish an anatomical and pathological laboratory. This would, of course, involve a considerable expenditure, but I am of the opinion that it would be a wise thing for the Smithsonian Institution to consider the question and to arrange to have the park advance along that line of growth. A proper structure for the purposes above mentioned suitably fitted with the necessary simple apparatus would probably cost \$15,000.

*Lunch and rest house.*—The visiting public is by no means properly served at present in the park, which is rather remote from restaurants or other places where food can be obtained, yet so extensive that a proper view of the collection occupies at least half a day. Very many visitors would be greatly benefited if there were a properly equipped lunch stand where food could be purchased at reasonable prices. This is so generally understood in other places that the lack of such facilities in the park is always a matter of surprise. There is at present only a very inadequate counter, kept on an exposed pavilion, which has to be closed up whenever the weather is inclement. Besides this, persons are not infrequently taken ill or become fatigued while at the park, and there should be means for meeting such emergencies. It is thought that a suitable structure for this purpose, containing the necessary cooking range, rest rooms, and water-closets, can be built for \$15,000.

*Fill across valley, Ontario Road.*—The administration has been considerably embarrassed by the great quantity of earth and débris that is washed down into the park from Ontario Road after every heavy rain. The Commissioners of the District were authorized to extend Adams Mill Road across a deep valley at the foot of Ontario Road, and this has made necessary a very heavy fill of loose earth that is readily excavated by rains. Attempts have been made to arrest this flow, which amounts to many tons of earth, but the means at the disposal of the park are inadequate.

*Additions to the collection.*—The park is greatly in need of certain well-known animals to make its exhibit more complete. I do not refer to those which are excessively rare, but to those that are common objects of interests to the public. The anthropoid apes, including the gorilla, the orang, the chimpanzee, and the gibbon, should be shown; also the rhinoceros, the East Indian tapir, the giraffe, the eland, the Beisa antelope, the koodoo, the East African buffalo, and a series of mountain goats and sheep, including those from the Western States.

Respectfully submitted.

FRANK BAKER, *Superintendent.*

Dr. CHARLES D. WALCOTT,

*Secretary the Smithsonian Institution, Washington, D. C.*

## APPENDIX 5.

### REPORT ON THE ASTROPHYSICAL OBSERVATORY.

SIR: I have the honor to present the following report on the operations of the Smithsonian Astrophysical Observatory for the year ending June 30, 1914:

#### EQUIPMENT.

The equipment of the Observatory is as follows:

(a) At Washington there is an inclosure of about 16,000 square feet, containing five small frame buildings used for observing and computing purposes, three movable frame shelters covering several out-of-door pieces of apparatus, and also one small brick building containing a storage battery and electrical distribution apparatus.

(b) At Mount Wilson, Cal., upon a leased plot of ground 100 feet square, in horizontal projection, are located a one-story cement observing structure, designed especially for solar-constant measurements, and also a little frame cottage, 21 feet by 25 feet, for observer's quarters.

Upon the observing shelter at Mount Wilson there is a tower 40 feet high above the 12-foot piers which had been prepared in the original construction of the building. This tower has been equipped with an improvised tower telescope for use when observing (with the spectrolometer) the distribution of radiation over the sun's disk.

Other pieces of apparatus for research have been purchased or constructed at the Observatory shop. The value of these additions to the instrumental equipment, not counting the tower above mentioned and its equipment, is estimated at \$1,500.

#### WORK OF THE OBSERVATORY.

##### AT WASHINGTON.

*Observations.*—Mr. Fowle has continued the difficult research on the transmission through moist air of radiations of great wave length, such, for instance, as those which bodies at the temperature of the earth emit most freely. He uses a very powerful lamp made up of a large number of Nernst electric glowers, and examines by the aid of the spectrolometer the energy spectrum of the rays

emitted by this lamp, first directly, and then, after the rays have traversed twice or four times a tube 200 feet long, containing air of measured humidity. During the past year Mr. Fowle has been dealing principally with rays of the very longest wave lengths of the terrestrial energy spectrum which moist air transmits. He has reached a wave length of about eighteen microns, which is about twenty-five times the longest wave length visible to the eye, and about three and one-half times the wave length of the solar rays investigated by this observatory in the years 1890 and 1900.

A great number of difficulties are met with. In the first place, great sensitiveness of the bolometer is required, owing to the feebleness of these rays. Attempts to use a vacuum bolometer have consumed much time, but not yet with entire success. Full success in this seems now probable. In the second place there is great difficulty in determining the amount of radiation lost in the optical train required to reflect the beam to and fro through the long tube. A principal difficulty in this matter arises from the fact that the lamp and its surroundings are unequally hot at different parts, for this has led to different degrees of loss at different wave lengths. This last source of error is so obscure that it escaped our attention for a long time and has required the observations to be repeated after results worthy of publication had, as it was thought, been reached. These and a host of other difficulties have delayed the research, but great hope is now felt that satisfactory results will be ready for publication in another year.

*Computations.*—The reductions of Mount Wilson and Washington observations take a large part of the time of Mr. Fowle and Mr. Aldrich, as well as the entire time of Miss Graves and a portion of that of Mr. Carrington. This work is nearly up to date.

Mr. Fowle has continued the study of the effect of terrestrial water vapor on the Mount Wilson solar observations and has published several valuable papers upon it. An interesting result is, that after determining and correcting for the effect of atmospheric water vapor on the transmission of solar rays the coefficients of atmospheric transparency determined at Mount Wilson when combined with the barometric pressure after the manner indicated by Lord Rayleigh's theory of gaseous scattering of light, yield the value 2.70 billion billion as the number of molecules at standard pressure and temperature in a cubic centimeter of gas. Prof. Millikan, by a wholly independent kind of reasoning, has derived from electrical experiments the value 2.705 billion billion. The close agreement found is a strong confirmation of the accuracy of our determinations of atmospheric transparency, and accordingly tends to increase confidence in our determination of the solar constant of radiation.

## PREPARATION OF APPARATUS.

*Sky radiation instruments.*—The director and Mr. Aldrich have devoted much time to the design and testing of apparatus for measuring the scattered radiation of the sky by day. What is desired is an instrument exposing horizontally an absorber of radiation in such a manner that the rays of the entire visible hemisphere of the sky would be received upon it, all rays not of solar origin would be excluded by a suitable screen, and the total energy of the scattered sky radiation originally emitted by the sun would be measured accurately. This is a more difficult problem than the measurement of the direct solar radiation, and it is unlikely that quite as high precision can be attained with the sky radiation instrument as with the pyrhelimeters used for measuring direct solar radiation. From experiments with several instruments of the kind which have been constructed in the observatory shop by Mr. Kramer and tested by Messrs. Abbot and Aldrich it now seems probable that the sources of error can be so far eliminated that sky radiation measurements accurate to about 2 per cent will be made. An instrument embodying what are thought to be the final improvements of design is now under construction, and it is hoped it will be used a great deal in the coming year.

*Balloon pyrhelimeters.*—Still more time has been devoted by Messrs. Abbot, Aldrich, and Kramer to the reconstruction and testing of balloon pyrhelimeters. Mention was made in last year's report of the proposed measurements of solar radiation by apparatus attached to sounding balloons and raised to great elevations. As stated below, the first trials, in August, 1913, while unexpectedly successful in many ways, did not enable us to obtain measurements above the elevation of about 14,000 meters, or 45,000 feet. At this elevation the mercury froze in the thermometers. Also, the clockwork proved not sufficiently accurate for best results. Still the results obtained were so promising that it was thought well to repeat the experiments.

Accordingly the five balloon pyrhelimeters were reconstructed. Excellent French clocks were substituted for those used in 1913, and many improvements of the instruments were introduced. Two devices were employed to prevent the freezing of the mercury in the thermometer. In some instruments water jackets, having numerous interior copper bars to act as heat conductors, were arranged. In these it was hoped to make available the latent heat of freezing of the water and thus to prevent the surroundings of the pyrhelimetric apparatus from descending far below the freezing point of water. In other instruments electrical temperature regulators were provided. Many experiments were tried to obtain a constant, powerful, and

very light electric battery for this purpose. At length a modification of the Roberts cell was designed, in which individual cells weighing 20 grams ( $\frac{3}{4}$  ounce) would furnish a constant potential of 1.3 volts and yield a nearly constant current of about 0.5 ampere for nearly two hours. The internal resistance of the cells was only about 0.3 ohms. Barometric elements were made to record on the same drum that recorded radiation. One instrument was constructed to be sent up at night, so as to show if any unexpected phenomena occurred when the instruments were being raised, apart from those due to the sun. Many tests of the instruments were made at different temperatures and pressures, and while immersed in descending air currents comparable to those anticipated to attend the flights. The accompanying illustration shows one of the balloon pyrhelimeters as reconstructed.

*Silver-disk pyrhelimeters.*—As in former years, a number of silver-disk pyrhelimeters were standardized at the Observatory and sent out by the Institution to several foreign Government observatories.

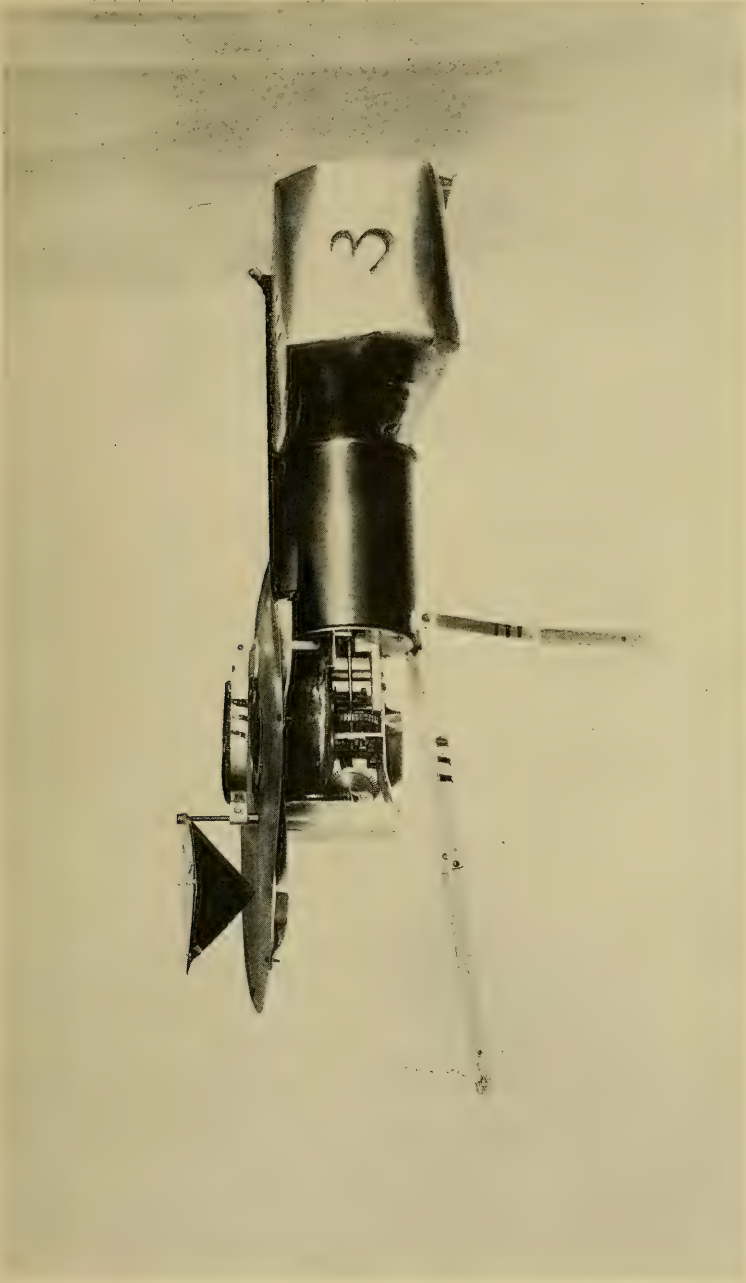
#### IN THE FIELD.

##### MOUNT WILSON EXPEDITION OF 1913.

Mr. Aldrich went to Mount Wilson early in July, 1913, and carried on there solar constant measurements until September when he was joined and then relieved by Mr. Abbot, who continued the observations until November. An expedition at the charge of the private funds of the Smithsonian, and under the direction of Mr. A. K. Ångström, was in California during July and August for the purpose of measuring nocturnal radiation at different altitudes, ranging from below sea level to the summit of Mount Whitney, 4,420 meters (14,502 feet). Mr. Aldrich cooperated as far as possible with this expedition.

*Balloon pyrhelometry.*—At the same time a cooperating expedition from the United States Weather Bureau made ascents of captive and free balloons in order to determine the temperature, pressure, and humidity at great elevations, for use in reducing Mr. Ångström's observations. Advantage was taken of the opportunity to send up special pyrhelimeters for measuring solar radiation at great altitudes. These experiments, which were made jointly by Mr. Aldrich and Mr. Sherry of the Weather Bureau, were referred to by anticipation in last year's report. Five balloon pyrhelimeters were sent up from Santa Catalina Island. All were recovered, with readable records. One instrument unfortunately lay in a field about six weeks before recovery, and parts of its record referring to the higher elevations were obliterated, but it yielded the best results of any up to about 8,000 meters. Two of the instruments unfortunately were





BALLOON PYRHELIOMETER.



shaded by cirrus clouds until after the mercury froze in their thermometers. The highest elevation at which a radiation record was obtained was about 14,000 meters, or nearly 45,000 feet. As stated in last year's report no results indicating that values of solar radiation exceeding our solar constant value (1.93 calories) are obtainable by pyrheliometric measurements at any elevation, however high, appear from these balloon pyrheliometer experiments. In view of the proposed repetition of the experiments with improved apparatus no further statement of these preliminary results is necessary here.

*The tower-telescope work.*—As stated in former reports, investigations were carried on at Washington during the years 1904 to 1907 to determine the distribution of the sun's radiation along the diameter of the solar disk. It was shown by this work, in accord with results of earlier observers, that the edge of the solar disk is much less bright than the center, and that this contrast of brightness is very great for violet and ultra-violet rays, but diminishes steadily with increasing wave-lengths, and becomes very slight for red and especially for infra-red rays. These phenomena are well shown in

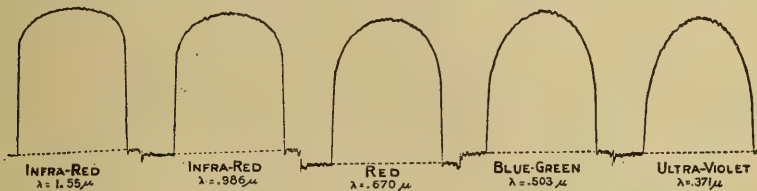


FIG. 1.—Brightness distribution along sun's diameter for different colors.

the accompanying illustration, from observations of 1913. The measurements were continued at Washington on all suitable days in the hope that some fluctuation of this contrast of brightness between the edge and center of the solar disk would be disclosed. It seemed probable that there might be such fluctuations associated with the irregular variability of the total solar radiation. It proved, however, that such fluctuations, if existing, were of so small an order of magnitude that it was not certain whether they were really shown by the observations at Washington, hampered as these were by variable transparency of the air.

When the observing station was erected on Mount Wilson in 1908 provision was made for a tower telescope designed to continue this research. When in 1911 and 1912 the Algerian expeditions confirmed the sun's variability, added interest was felt in the proposed experiments. Accordingly, the tower, 50 feet in height, was completed in 1912. Not sufficient funds were available to equip the tower telescope, but Director Hale, of the Mount Wilson Solar Observatory, kindly loaned considerable apparatus, and with this and some appa-

ratus which remained from eclipse expeditions, and by using anything available, as, for instance, a trunk of a tree for a mirror support at the top of the tower, Messrs. Abbot and Aldrich succeeded in getting arranged on the tower a reflecting telescope of 12 inches aperture and 75 feet focus, all ready for observations by September 9, 1913. Then and thereafter solar constant measurements were supplemented by determinations of the distribution of radiation along the sun's diameter on each day of observation. These determinations are made in seven different wave lengths on each day, ranging from  $0.38\mu$  in the ultra violet to  $1.1\mu$  in the infra-red. Fortunately, the definition of the tower telescope proves to be very good. There is slight change of focus during the several hours of observing, and the "seeing" seems not to deteriorate much up to 10 o'clock a. m., at which time the observations are generally concluded.

About 45 days of simultaneous observations of the "solar constant" and of the distribution of radiation over the sun's disk were secured in 1913. The results appear to indicate a variability in both phenomena and a distinct correlation of the two in point of time. It is indicated that when in course of its short-period irregular variation the solar radiation increases, there occurs simultaneously a diminution of the contrast between the edge and center of the sun's disk. A change of brightness of about 1.5 per cent was found to occur at 95 per cent out on the solar radius accompanying a change of 6 per cent in the solar radiation. On comparing the mean of all results obtained in 1913 with the mean of all obtained in Washington in 1906-7, it appears that there was distinctly less contrast of brightness between the edge and center of the sun's disk in 1913 than in 1907. We have reason, however, to believe that there was distinctly a greater total solar radiation in 1907 than in 1913. This result, compared with the result stated above, indicates a difference of character between the long-period fluctuations of the sun and its short-period irregular fluctuations. The changes of contrast found, however, agree in this, that whether from day to day in 1913, or as between 1913 and 1907, the violet or shorter wave lengths change in contrast more than the red or longer wave lengths.

#### MOUNT WILSON EXPEDITION OF 1914.

Mr. Abbot continued the Mount Wilson work, beginning in May, 1914. Many improvements were made in the tower telescope, leading to improved definition and stability of the image of the sun. Improved methods of observing were introduced also.

#### BALLOON PYRHELIOMETRY.

Mr. Aldrich, in cooperation with the United States Weather Bureau observers, under personal direction of Dr. Blair, arranged to

repeat the balloon pyrheliometer observations, and this time at Omaha. Ascensions were not made until after July 1, 1914, but it may be said in anticipation that two ascensions by day and one by night were made. All three instruments were recovered. No unexpected phenomena were disclosed by the night record. One day record appears to be excellent. Fortunately the instrument which recorded it came back uninjured, and further tests and calibrations with it are intended. The instrument reached a very great height, and recorded radiation successfully until after it began to descend. Preliminary reductions show that the values recorded fall below our adopted value of the solar constant of radiation.

#### SUMMARY.

Progress has been made in the measurement of the effects produced by atmospheric water vapor on solar and terrestrial radiation. New apparatus for measuring sky radiation has been devised and perfected. Special pyrheliometers have been constructed and caused to record solar radiation with considerable success at great altitudes when attached to free balloons. The results obtained tend to confirm the adopted value of the solar constant of radiation. Further results from balloon pyrheliometry are expected. A tower telescope has been erected and put in operation on Mount Wilson. By means of it the variability of the sun has been independently confirmed, for it appears that changes of the distribution of radiation over the sun's disk occur in correlation with the changes of the sun's total radiation.

Respectfully submitted.

C. G. ABBOT,

*Director Astrophysical Observatory.*

DR. CHARLES D. WALCOTT,

*Secretary of the Smithsonian Institution.*

## APPENDIX 6.

### REPORT ON THE LIBRARY.

SIR: I have the honor to present the following report upon the work of the Library of the Smithsonian Institution and its branches during the fiscal year ending June 30, 1914:

It is with deep regret that the library records the death, on June 25, 1914, of Dr. Frederick William True, assistant secretary of the Smithsonian Institution in charge of library and exchanges.

#### ACCESSIONS.

The additions to the library are received, with few exceptions, in exchange for the publications of the Institution or by gift. There were received during the year a total of 32,964 packages of publications, about 90 per cent of which came by mail and the balance through the International Exchange Service. The correspondence incident thereto aggregated about 2,000 written letters and 5,883 printed forms of acknowledgment.

There was catalogued, accessioned, and forwarded to the Smithsonian Deposit in the Library of Congress a total of 32,195 pieces, as follows: 3,765 volumes and 1,729 parts of volumes, 5,755 pamphlets, 20,603 periodicals, and 343 charts. In addition 1,062 parts of serials were received to complete imperfect sets. The accession entries were from 513,027 to 517,776.

There was also transferred to the Library of Congress without being stamped and recorded a total of 7,464 public documents presented to the Institution.

The accessions to the office library, the Astrophysical Observatory, and the National Zoological Park amounted to 1,165 publications, which were distributed as follows: 631 volumes, 93 parts of volumes, 46 pamphlets, and 1 chart were recorded for the office library; 106 volumes, 33 parts of volumes, and 212 pamphlets for that of the Astrophysical Observatory; and 39 volumes and 4 pamphlets for the National Zoological Park. This large increase over the previous year was due in part to the addition of nearly 100 books for the employees' library from the estate of Miss Lucy Hunter Baird and also to books acquired for the use of the Langley Aerodynamical Laboratory.

Complete sets of inaugural dissertations and technological publications from 35 universities and technical high schools were received from the following places: Baltimore, Basel, Berlin, Bern, Bonn, Braunschweig, Breslau, Dresden, Erlangen, Freiburg, Giessen, Greifswald, Halle-Wittenberg, Hamburg, Heidelberg, Helsingfors, Ithaca, Jena, Karlsruhe, Kiel, Königsberg, Leipzig, Louvain, Lund, Marburg, New Haven, Paris, Rostock, St. Petersburg, Strassburg, Toulouse, Tübingen, Uppsala, Würzburg, and Zürich.

#### EXCHANGES.

A considerable portion of the periodicals in the Smithsonian Library are obtained in exchange for publications of the Institution. During the year 138 new titles of periodicals were thus added to the large series of scientific journals already contained in the Smithsonian deposit. There were also secured 1,062 parts to complete imperfect sets of publications already in the library.

This work of completing the sets and series in the Smithsonian deposit is of great importance and has been carried forward with definite results.

In response to requests sent to various institutions, 832 missing parts have been supplied to complete 124 sets of publications of scientific institutions and learned societies, 151 parts of 62 periodicals and 78 parts of 30 sets and 1 map for the series in the general classification. Among the more important publications received and sent to the deposit to complete the sets may be mentioned 73 parts of the "Chetniia," of the University of Moscow, Russia, making the set complete from 1869 to date; also 60 parts of the *Boletín de la Sociedad Mexicana de Geografía y Estadística*, of Mexico City, Mexico, completing the set to date; and 4 sets of publications, comprising 78 volumes, from *Het Islenska Bokmentafelag*, of Reykjavik, Iceland, completing the sets from 1869 to date.

The securing of publications of historical societies in the United States and abroad has been continued, and many additional publications have been obtained and transmitted to the Library of Congress.

#### READING ROOM.

The reading room has been in constant use during the year. There are now on file about 270 foreign and domestic scientific periodicals which are required by the staff of the institution and its branches for consultation. In view of the fact that this collection contains representative scientific periodicals from all parts of the world, officers of the scientific bureaus of the various governmental establishments in Washington and students generally continue to take advantage of the opportunity to consult them.

## THE AERONAUTICAL LIBRARY.

With the inauguration of the Langley Aerodynamical Laboratory many important works on aeronautics published in the last few years were needed in connection with the work. A specially prepared list made by Dr. A. F. Zahm and Naval Constructor Jerome C. Hunsaker, United States Navy, was considered, and 120 publications not already on the shelves were secured.

## ART ROOM.

The collections of works on art have remained practically unchanged during the year. The administration of the National Gallery of Art being now under the National Museum, all books relating to the fine arts formerly assigned to the art room are now placed in the museum library as received.

## EMPLOYEES' LIBRARY.

The employees' library has been very fortunate in receiving, through the estate of Miss Lucy Hunter Baird, volumes in addition to those presented by her some years ago, which add interest to the collection of general literature for the use of the employees.

## NEW STEEL BOOK STACKS.

In the report on the library for last year the preliminary plans for the new steel book stacks for the main hall of the Smithsonian building were discussed. On March 14, 1914, a contract was entered into for the erection of the stacks in the east end and the completion of the work within 120 days from that date. On February 26, 1914, the wrecking of the galleries had begun with the moving of the books of the Bureau of American Ethnology library, and within 10 days the old galleries had been razed and the old exhibition cases removed, leaving the east end of the hall entirely free. At the end of the year the floor and walls at the east end of the hall had been repaired, the heating plant reinstalled, and the steel framework of the stacks put in place.

These stacks are of steel construction, in three tiers, one on the main floor and two above, the two above having floors of glass. On the east wall is a single-faced stack covering the entire wall area from the floor of the hall to the ceiling. At the two columns second from the east end is erected a double-faced stack, partitioning the stacks from the main hall, and on the west face of this stack are two galleries which are an extension of the floors of the stacks. The stacks between this partition and the east wall have open shelving throughout. A passageway on the lower floor leading to the offices of the Institution in the east end of the building has been provided



for, and the openings between the stacks on the sides provided with grill doors in order that the books on these shelves may be protected. The cases on the north and south walls of what is left of the main hall, as well as those under the first gallery, are provided with glass-panel doors in order to protect the contents, as it is the intention to use this hall for museum exhibition purposes.

#### CATALOGUE OF SMITHSONIAN PUBLICATIONS.

The manuscript of the dictionary catalogue of the publications of the Institution and its branches mentioned in last year's report is still in preparation, but it is expected that it will be ready for publication during the coming year.

#### UNITED STATES NATIONAL MUSEUM.

The library of the National Museum consists of the main library in the natural history building, to which have been transferred all the publications relating to biology and anthropology as well as those of a general character; the technological series, in the older, or arts and industries building, which at present includes publications relating to technology, and for convenience those on history and botany. These two libraries do not include, however, some 30 sectional libraries in the scientific departments and divisions of the Museum. In making this arrangement the convenience and interests of the scientific staff have been the only consideration. The entire library of the Museum now contains 43,609 volumes, 73,765 pamphlets and unbound papers, and 124 manuscripts. The accessions during the past year were 1,917 volumes, 1,723 pamphlets, and 132 parts of volumes.

In the library of the Museum 755 books were catalogued; 2,001 pamphlets; total number of cards made, 3,520; completed volumes of periodicals catalogued, 1,162; parts of publications, 12,833; parts of periodicals entered, 397; 397 new periodical cards were made, and 8 books and 362 pamphlets were recatalogued.

The number of books, periodicals, and pamphlets borrowed from the general library was 20,884, which includes 9,718 obtained from the Library of Congress, 376 from the Department of Agriculture, 105 from the United States Geological Survey, 90 from the Army Medical Museum and Library, 2 from the United States Bureau of Education, 4 from the United States Patent Office, 4 from the Bureau of Fisheries, 1 from the United States Weather Bureau, 3 from the United States Naval Observatory, and 2 from Harvard University, Cambridge, Mass.

The securing of new exchanges for the Museum has been continued, with the result that many new publications have been added to the

catalogue, and much has been done toward securing, in connection with this work, parts of publications.

The moving of the biological, anthropological, and general reference series of the library to the new building having been completed in the previous year and the rearrangement of the publications on the shelves taken up, attention was given to the finishing of this latter task.

#### DUPLICATE MATERIAL.

For many years the Museum library was overcrowded to such an extent that the shelves had overflowed and it was impossible to have a proper arrangement of the books. With these publications were many duplicates which had been received by gift and otherwise from the very beginning.

Among the duplicate material were many volumes of United States Government documents duplicating publications already on the shelves, and these, being of no further use to the Institution, were transferred to the superintendent of documents, in accordance with law.

#### BINDING.

The lack of sufficient funds for the binding of publications is a serious question. This will obstruct the work in the future more than in the past, unless an adequate sum can be set aside, so that all the volumes may be bound and made ready for reference. To prepare a volume for binding and then to be obliged to take out parts of it urgently needed by the staff makes it incomplete, and should that part be lost the volume may remain incomplete, inasmuch as the publications which the Museum needs for its work are published in limited editions and it is often impossible again to secure them for binding when there is money available for the purpose.

During the year 690 volumes were prepared for binding and sent to the Government bindery for that purpose.

#### GIFTS.

Many important gifts were received by the library during the year, the estate of Miss Lucy Hunter Baird being one of the donors. The following members of the staff presented publications: Dr. William Healey Dall, Dr. O. P. Hay, Dr. C. W. Richmond, Dr. Edgar A. Mearns, Mr. Alfred Klakring, and Dr. Harriet Richardson Searle.

#### BAIRD LIBRARY.

Spencer Fullerton Baird, second secretary of the Smithsonian Institution, gave his valuable scientific library to the United States National Museum when the Museum library was founded. He re-

tained during his lifetime a number of volumes, and after his death his daughter, Miss Lucy Hunter Baird, continued to add to these books. In her will, which was probated after her death last year, she left to the Museum this collection, which numbered 750 volumes.

#### DALL LIBRARY.

A number of books relating to mollusks was presented to the Museum in 1892 by Dr. William Healey Dall, and he has added to this gift from year to year. The number of titles is now about 7,500, and these, with a comparatively small number of books from other sources, make up the sectional library of the division of mollusks. During the past year Dr. Dall has added about 50 titles. The cataloguing of these books was completed during the past year under Dr. Dall's personal direction.

#### TECHNOLOGICAL SERIES.

Periodicals entered on the records of the technology library have numbered 476 complete volumes, 6,096 parts of volumes, and the new periodical cards made for these have been 331. The cataloguing for the year numbered 256 volumes and 747 pamphlets, requiring 1,187 separate cards. The total number of cards typewritten, periodical and catalogue, is 1,518. In addition, about 500 volumes and 8,000 pamphlets have been placed on the shelves under their respective class numbers and will be incorporated later in the records which are now in preparation.

Books and pamphlets loaned during the year in addition to those from the general library numbered 188 volumes and 290 single pamphlets and parts of periodicals, making a total number of 478 publications. About 360 books have been consulted in the reading room, and about 3,000 books and periodicals have been transferred to the various sections of mineral technology, textiles, and graphic arts, and section cards made for these.

The science depository set of cards from the Library of Congress was received last year, and about 28,000 have been filed alphabetically. About the same number remain to be filed before the set is in alphabetical order. When completed it will be a useful index to the scientific resources of Washington. The catalogue has been completed for all the books in the reading room and about two-thirds of the east gallery, leaving the north gallery and the remainder of the east gallery still to be done.

#### SECTIONAL LIBRARIES.

The sectional libraries of the Museum have been receiving reference publications for which receipts have been given and filed in

the library, but since the moving to the new building no systematic checking has been done of what is now on the shelves in the libraries placed in the departments and divisions. It seems desirable and important that this matter should receive consideration, and it is recommended that a competent cataloguer be employed to do this special work. It is estimated that it would require a year's time to complete the work.

The sectional libraries now existing are as follows:

Administration.	Marine invertebrates.
Administrative assistant's office.	Materia medica.
Anthropology.	Mechanical technology.
Biology.	Mollusks.
Birds.	Oriental archeology.
Botany.	Paleobotany.
Comparative anatomy.	Parasites.
Editor's office.	Photography.
Ethnology.	Physical anthropology.
Fishes.	Prehistoric archeology.
Geology.	Reptiles and batrachians.
Graphic arts.	Superintendent's office.
History.	Taxidermy.
Insects.	Textiles.
Invertebrate paleontology.	Vertebrate paleontology.
Mammals.	

#### BUREAU OF AMERICAN ETHNOLOGY.

This library is administered under the direct care of the ethnologist in charge, and a report on its operations will be found in the general report of the bureau.

#### ASTROPHYSICAL OBSERVATORY:

Books relating directly to astrophysics have been brought together for the use of the Observatory. It is a valuable series of technical works and all the publications are in constant use. During the year 351 publications have been added, consisting of 106 volumes, 33 parts of volumes, and 212 pamphlets. There were 64 volumes bound at the Government Printing Office.

#### NATIONAL ZOOLOGICAL PARK.

The collection of works on zoological subjects, which are kept in the office of the superintendent of the park, is not very large, but they all relate to the work which is being carried on. During the year 39 volumes and 4 pamphlets have been added.

## SUMMARY OF ACCESSIONS.

The following statement summarizes the accessions during the year, with the exception of the library of the Bureau of American Ethnology:

To the Smithsonian deposit in the Library of Congress, including parts to complete sets.....	12,654
To the Smithsonian office, Astrophysical Observatory, and Zoological Park .....	1,165
To the United States National Museum.....	3,772
Total .....	17,591

Respectfully submitted.

PAUL BROCKETT,  
*Assistant Librarian.*

DR. CHARLES D. WALCOTT,  
*Secretary of the Smithsonian Institution.*

## APPENDIX 7.

### REPORT ON THE INTERNATIONAL CATALOGUE OF SCIENTIFIC LITERATURE.

SIR: I have the honor to submit the following report on the operations of the United States Bureau of the International Catalogue of Scientific Literature for the year ending June 30, 1914:

This enterprise was organized in 1901 and has for its object the preparation and publication of an annual classified index to the current literature of science. The catalogue is published in the form of a classified book index, each paper referred to being first listed under the author's name and again under the subject or subjects of the contents. Seventeen main volumes are issued each year, one for each of the following-named branches of science: Mathematics, mechanics, physics, chemistry, astronomy, meteorology, mineralogy, geology, geography, paleontology, general biology, botany, zoology, anatomy, anthropology, physiology, and bacteriology.

All of the first 9 annual issues have been published, together with 16 volumes of the tenth issue, 8 volumes of the eleventh issue, and 1 volume of the twelfth, a total of 178 regular volumes, in addition to several special volumes of schedules, lists of journals, etc. The number of pages in each annual issue is shown in the following table:

	Pages.
First annual issue.....	7,763
Second annual issue.....	8,826
Third annual issue.....	8,493
Fourth annual issue.....	8,681
Fifth annual issue.....	10,785
Sixth annual issue.....	10,049
Seventh annual issue.....	9,219
Eighth annual issue.....	8,699
Ninth annual issue.....	7,933
Tenth annual issue.....	8,447

The large increase in size of the fifth and sixth annual issues necessitated a change in the plan of publication, the object in view being to reduce the bulk and consequent cost of the work while not reducing its usefulness. This has been accomplished by printing the full titles and references only once—that is, in the author catalogue—the subject catalogue containing only the author's name and

a number referring to a like number in the author's catalogue where the full reference may be found. Following this plan has resulted in a marked reduction in the size of the eighth, ninth, and tenth issues.

The central bureau of the organization is maintained in London and has charge of receiving, editing, and publishing the classified references furnished by the 33 regional bureaus cooperating in the production of the catalogue. These regional bureaus are maintained for the most part by direct governmental grants made by the countries in which they are situated. The annual subscription price for a complete set of 17 volumes is \$85. The proceeds derived from subscriptions are used entirely to support the central bureau.

During the year 28,606 cards were sent from this bureau to the London central bureau, as follows:

Literature of—	
1905	169
1906	64
1907	133
1908	621
1909	223
1910	852
1911	2,988
1912	8,010
1913	15,546
Total	28,606

The following table shows the number of cards sent each year as well as the number of cards representing the literature of each year from 1901 to 1913, inclusive:

Literature of—	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	Total for year.
Year ending June 30—														
1902	6,990													6,990
1903	6,150	8,330												14,480
1904	3,044	9,424	8,745											21,213
1905	1,619	2,780	11,143	8,640										24,182
1906	301	622	3,538	12,139	9,001									25,601
1907	384	511	862	5,272	9,022	12,578								28,629
1908	408	523	366	956	5,629	7,217	13,429							28,528
1909	133	235	373	309	1,656	4,410	8,509	18,784						34,409
1910	72	173	248	465	1,163	1,502	3,160	6,305	11,994					25,082
1911	3	26	28	218	129	374	423	1,301	8,836	14,682				26,020
1912			4	243	386	562	1,480	1,949	3,372	5,231	13,974			27,201
1913		9	5	12	14	131	226	324	685	3,214	6,950	16,425		27,995
1914					169	64	133	621	223	852	2,988	8,010	15,546	28,606
Total	19,104	22,633	25,312	28,254	27,169	26,838	27,360	29,284	25,110	23,979	23,912	24,435	15,546	318,936

As has been pointed out in several previous annual reports, this enterprise is in no sense commercial, and should be freed from the necessity of depending entirely on subscription for its maintenance. A comparatively small endowment would materially aid in improving the form and expanding the scope of the index to include some of the applied sciences. Could this be done, it is more than probable that increased demands would more than make up for increased expense, for when the catalogue meets the demands of the applied sciences, as it now does those of pure science, it will become a general work of reference for all branches of arts and industries. The organization is complete and satisfactory, and its usefulness could be greatly increased by the expenditure of a comparatively small sum annually.

No advance or improvement can, however, be undertaken until an assured additional income becomes available.

The International Catalogue was originally organized by a number of international conferences, the third of which met in London in July, 1900. The delegates there assembled provided that an international convention should meet in London in 1905, in 1910, and every tenth year thereafter to reconsider and revise, if necessary, the regulations governing the enterprise.

It was provided also that an international council should meet in London at least once every three years to regulate the affairs of the catalogue between two successive meetings of the convention. A meeting of this international council was held June 11 and 12, 1914, and after authorizing the necessary contracts for the continuation of the enterprise and disposing of a number of other routine matters, discussed the very vital question of altering and revising the classification schedules. It was provided that further alteration would best be made by the introduction of subdivisions to the now existing schedules, such subdivisions to be suggested by the regional bureaus as the need for them should appear.

Very respectfully, yours,

LEONARD C. GUNNELL,  
*Assistant in Charge.*

DR. CHARLES D. WALCOTT,  
*Secretary of the Smithsonian Institution.*



## APPENDIX 8.

### REPORT ON THE PUBLICATIONS.

SIR: I have the honor to submit the following report on the publications of the Smithsonian Institution and its branches during the year ending June 30, 1914:

The Institution proper published during the year 36 papers in the series of "Smithsonian Miscellaneous Collections," an annual report, and pamphlet copies of 38 papers from the general appendix of the report. The Bureau of American Ethnology published 2 bulletins and a separate paper, and the United States National Museum issued 2 annual reports, 49 miscellaneous papers from the proceedings, 9 new bulletins and parts, and 9 parts of volumes pertaining to the National Herbarium.

The total number of copies of publications distributed by the Institution proper during the year was 107,471. The aggregate includes 1,229 volumes of Smithsonian Contributions to Knowledge; 59,777 volumes and separates of Smithsonian Miscellaneous Collections; 23,279 volumes and separates of the Smithsonian annual reports; 6,483 special publications; 1,477 copies of volume 3, Annals of the Astrophysical Observatory; 775 reports of the Harriman Alaska Expedition; 12,819 volumes and separates of the Bureau of American Ethnology publications; 1,412 annual reports of the American Historical Association; 26 publications of the United States National Museum; and 194 publications not of the Smithsonian Institution or its branches. Additional copies of the third edition of the Smithsonian Geographical Tables were printed just before the close of the year. There were also distributed by the National Museum 93,200 copies of its several publications, making a total of 202,671 publications distributed by the Institution and its branches during the year.

#### SMITHSONIAN CONTRIBUTIONS TO KNOWLEDGE.

##### QUARTO.

No publications of this series were issued during the year.

#### SMITHSONIAN MISCELLANEOUS COLLECTIONS.

##### OCTAVO.

Of the Miscellaneous Collections, volume 57, 3 papers were published; of volume 59; 1 paper, and title-page and table of contents;

of volume 60, 2 papers, and title-page and table of contents; of volume 61, 21 papers, and title-page and table of contents; of volume 62, 2 papers; of volume 63, 6 papers; and of volume 64, 1 paper; in all, 36 papers, as follows:

*Volume 57.*

- No. 11. Cambrian geology and paleontology. II. New Lower Cambrian subfauna. By Charles D. Walcott. Published July 21, 1913. Pp. 309-326, pls. 50-54. (Publ. 2185.)
- No. 12. Cambrian geology and paleontology. II. Cambrian formations of the Robson Peak district, British Columbia and Alberta, Canada. By Charles D. Walcott. July 24, 1913. Pp. 327-343, pls. 55-59. (Publ. 2186.)
- No. 13. Cambrian geology and paleontology. II. Dikelocephalus and other genera of the Dikelocephalinae. By Charles D. Walcott. April 4, 1914. Pp. 345-412 and index, pls. 60-70. (Publ. 2187.)
- [Title-pages and table of contents.] (Publ. 2270.) In press.

*Volume 59.*

- No. 19. Eearly Norse Visits to North America. By William H. Babcock. July 9, 1913. iii+213 pp., 10 pls.
- Title-page and table of contents. vi pp. August 7, 1913. (Publ. 2234.)

*Volume 60.*

- No. 23. The influence of the atmosphere on our health and comfort in confined and crowded places. By Leonard Hill, Martin Flack, James McIntosh, R. A. Rowlands, and H. B. Walker. Hodgkins Fund. July 15, 1913. 96 pp. (Publ. 2170.)
- No. 30. Explorations and field work of the Smithsonian Institution in 1912. March 28, 1913. 76 pp., 82 figs. (End of volume.) (Publ. 2178.)
- Title-pages and table of contents. August 7, 1913. vi pp. (Publ. 2235.)

*Volume 61.*

- No. 1. The White Rhinoceros. By Edmund Heller. October 11, 1913. 77 pp., 31 pls. (Publ. 2180.) [Nos. 2 to 5 of this volume were published during previous year.]
- No. 6. Great stone monuments in history and geography. By J. Walter Fewkes. September 15, 1913. 50 pp. (Publ. 2229.)
- No. 7. New races of antelopes from British East Africa. By Edmund Heller. July 31, 1913. 13 pp. (Publ. 2231.)
- No. 8. The comparative histology of the femur. By Dr. J. S. Foote. August 22, 1913. 9 pp., 3 pls. (Publ. 2232.)
- No. 9. Descriptions of three new African weaver birds of the genera *Estrilda* and *Granatina*. By Edgar A. Mearns. July 31, 1913. 4 pp. (Publ. 2236.)
- No. 10. Descriptions of four new African thrushes of the genera *Planesticus* and *Geocichla*. By Edgar A. Mearns. August 11, 1913. 5 pp. (Publ. 2237.)
- No. 11. Descriptions of six new African birds. By Edgar A. Mearns. August 30, 1913. 5 pp. (Publ. 2238.)
- No. 12. *Populus Macdougalii*. A new tree from the Southwest. By J. N. Rose. September 3, 1913. 2 pp., 1 pl. (Publ. 2239.)
- No. 13. New antelopes and carnivores from British East Africa. By Edmund Heller. September 16, 1913. 15 pp. (Publ. 2240.)

- No. 14. Descriptions of five new African weaver birds of the genera *Othypantes*, *Hypargos*, *Aidemosyne*, and *Lagonostica*. By Edgar A. Mearns. September 20, 1913. 5 pp. (Publ. 2241.)
- No. 15. Notes on the recent crinoids in the British Museum. By Austin Hobart Clark. December 31, 1913. 89 pp. (Publ. 2242.)
- No. 16. A new shrub of the genus *Esenbeckia* from Colombia. By Dr. K. Krause. September 29, 1913. 1 p. (Publ. 2243.)
- No. 17. New races of ungulates and primates from Equatorial Africa. By Edmund Heller. October 21, 1913. 12 pp. (Publ. 2245.)
- No. 18. Anthropological work in Peru in 1913, with notes on the pathology of the ancient Peruvians. By Dr. Aleš Hrdlička. February 12, 1914. 69 pp., 26 pls. (Publ. 2246.)
- No. 19. New races of carnivora and baboons from Equatorial Africa and Abyssinia. By Edmund Heller. November 8, 1913. 12 pp. (Publ. 2248.)
- No. 20. Descriptions of 10 new African birds of the genera *Pogonocichla*, *Cosypha*, *Bradypterus*, *Sylvietta*, *Melaniparus*, and *Zosterops*. By Edgar A. Mearns. November 29, 1913. 8 pp. (Publ. 2251.)
- No. 21. Fifty-one new Malayan mammals. By Gerrit S. Miller, jr. December 29, 1913. 30 pp. (Publ. 2252.)
- No. 22. Four new subspecies of large mammals from Equatorial Africa. By Edmund Heller. January 26, 1914. 7 pp. (Publ. 2255.)
- No. 23. A new genus of Mallophaga from African guinea fowl in the United State National Museum. By John Howard Paine. January 31, 1914. 4 pp. (Publ. 2258.)
- No. 24. New Sapindaceæ from Panama and Costa Rica. By Prof. Dr. L. Radlkofer. February 9, 1914. 8 pp. (Publ. 2259.)
- No. 25. Descriptions of eight new African Bulbuls. By Edgar A. Mearns. February 16, 1914. 6 pp. (Publ. 2260.)
- Title-pages and table of contents. March 13, 1914. vi pp. (Publ. 2265.)

*Volume 62.*

- No. 1. Advisory Committee on the Langley Aerodynamical Laboratory. Hodgkins Fund. July 17, 1913. 5 pp. (Publ. 2227.)
- No. 2. Hydromechanic experiments with flying-boat hulls. By H. C. Richardson. Hodgkins Fund. April 20, 1914. 9 pp., 6 pls. (Publ. 2253.)
- No. 3. Report on European aeronautical laboratories. By A. F. Zahm. 23 pp., 11 pls. (Publ. 2273.) In press.

*Volume 63.*

- No. 1. Atmospheric air in relation to tuberculosis. By Guy Hinsdale. Hodgkins Fund. June 22, 1914. 136 pp., 93 pls. (Publ. 2254.)
- No. 2. Notes on some specimens of a species of Onychophore (*Oroperipatus corradoi*) new to the fauna of Panama. By Austin Hobart Clark. February 21, 1914. 2 pp. (Publ. 2261.)
- No. 3. A new Ceratopsian dinosaur from the Upper Cretaceous of Montana, with note on *Hypacrosaurus*. By Charles W. Gilmore. March 21, 1914. 10 pp., 2 pls. (Publ. 2262.)
- No. 4. On the relationship of the genus *Aulacocarpus*, with description of a new Panamanian species. By H. Pittier. March 18, 1914. 4 pp. (Publ. 2264.)
- No. 5. Descriptions of five new mammals from Panama. By E. A. Goldman. March 14, 1914. 7 pp. (Publ. 2266.)

- No. 6. Physical Tables. Sixth edition. F. E. Fowle. (Publ. 2269.) In press.  
 No. 7. New subspecies of mammals from Equatorial Africa. By Edmund Heller. June 24, 1914. 12 pp. (Publ. 2272.)

*Volume 64.*

- No. 1. Cambrian geology and paleontology. III. The Cambrian Faunas of Eastern Asia. By Charles D. Walcott. April 22, 1914. Pp. 1-76, pls. 1-3. (Publ. 2263.)  
 No. 2. Cambrian geology and paleontology. III. Pre-Cambrian Algonkian Algal Flora. By Charles D. Walcott. Pp. 77-156, pls. 4-23. (Publ. 2271.) In press.

SMITHSONIAN ANNUAL REPORTS.

*Report for 1912.*

The Annual Report of the Board of Regents for 1912 was received from the Public Printer in completed form in October, 1913.

Annual Report of the Board of Regents of the Smithsonian Institution, showing operations, expenditures, and condition of the Institution for the year ending June 30, 1912. xii, 780 pp., 72 pls. (Publ. 2188.)

Small editions of the following papers, forming the general appendix of the annual report for 1912, were issued in pamphlet form:

- The year's progress in astronomy. By P. Puiseux. 8 pp. (Publ. 2189.)  
 The spiral nebulae. By P. Puiseux. 10 pp. (Publ. 2190.)  
 The radiation of the sun. By C. G. Abbot. 13 pp., 4 pls. (Publ. 2191.)  
 Molecular theories and mathematics. By Émile Borel. 20 pp. (Publ. 2192.)  
 Modern mathematical research. By G. A. Miller. 12 pp. (Publ. 2193.)  
 The connection between the ether and matter. By Henri Poincaré. 12 pp. (Publ. 2194.)  
 Experiments with soap bubbles. By C. V. Boys. 8 pp., 1 pl. (Publ. 2195.)  
 Measurements of infinitesimal quantities of substances. By William Ramsay. 11 pp. (Publ. 2196.)  
 The latest achievements and problems of the chemical industry. By Carl Duisberg. 26 pp. (Publ. 2197.)  
 Holes in the air. By W. J. Humphreys. 12 pp., 2 pls. (Publ. 2198.)  
 Review of applied mechanics. By L. Lecornu. 16 pp. (Publ. 2199.)  
 Report on the recent great eruption of the volcano "Stromboli." By Frank A. Perret. 5 pp., 9 pls. (Publ. 2200.)  
 The glacial and postglacial lakes of the Great Lakes region. By Frank B. Taylor. 37 pp. (Publ. 2201.)  
 Applied geology. By Alfred H. Brooks. 24 pp. (Publ. 2202.)  
 The relations of paleobotany to geology. By F. H. Knowlton. 6 pp. (Publ. 2203.)  
 Geophysical research. By Arthur L. Day. 11 pp. (Publ. 2204.)  
 A trip to Madagascar, the country of beryls. By A. Lacroix. 12 pp. (Publ. 2205.)  
 The fluctuating climate of North America. By Ellsworth Huntington. 30 pp., 10 pls. (Publ. 2206.)  
 The survival of organs and the "culture" of living tissues. By R. Legendre. 8 pp., 4 pls. (Publ. 2207.)  
 Adaptation and inheritance in the light of modern experimental investigation. By Paul Kammerer. 21 pp., 8 pls. (Publ. 2208.)

- The paleogeographical relations of antarctica. By Charles Hedley. 11 pp. (Publ. 2209.)
- The ants and their guests. By P. E. Wasmann. 20 pp., 10 pls. (Publ. 2210.)
- The penguins of the antarctic regions. By L. Gain. 8 pp., 9 pls. (Publ. 2211.)
- The derivation of the European domestic animals. By C. Keller. 9 pp. (Publ. 2212.)
- Life: its nature, origin, and maintenance. By E. A. Schäfer. 33 pp. (Publ. 2213.)
- The origin of life: a chemist's fantasy. By H. E. Armstrong. 15 pp. (Publ. 2214.)
- The appearance of life on worlds and the hypothesis of Arrhénius. By Alphonse Berget. 9 pp. (Publ. 2215.)
- The evolution of man. By G. Elliot Smith. 20 pp. (Publ. 2216.)
- The history and varieties of human speech. By Edward Sapir. 23 pp. (Publ. 2217.)
- Ancient Greece and its slave population. By S. Zaborowski. 12 pp. (Publ. 2218.)
- Origin and evolution of the blond Europeans. By Adolphe Bloch. 22 pp. (Publ. 2219.)
- History of the finger-print system. By Berthold Laufer. 22 pp., 7 pls. (Publ. 2220.)
- Urbanism: A historic, geographic, and economic study. By Pierre Clerget. 15 pp. (Publ. 2221.)
- The Sinai problem. By E. Oberhummer. 9 pp., 3 pls. (Publ. 2222.)
- The music of primitive peoples and the beginnings of European music. By Willy Pastor. 22 pp. (Publ. 2223.)
- Expedition to the South Pole. By Roald Amundsen. 16 pp. (Publ. 2224.)
- Icebergs and their location in navigation. By Howard T. Barnes. 24 pp., 3 pls. (Publ. 2225.)
- Henri Poincaré, his scientific work, his philosophy. By Charles Nordmann. 23 pp. (Publ. 2226.)

### *Report for 1913.*

The report of the executive committee and proceedings of the Board of Regents of the Institution, as well as the report of the Secretary for the fiscal year ending June 30, 1913, both forming part of the annual report of the Board of Regents to Congress, were published in pamphlet form in November and December, respectively, 1913, as follows:

- Report of the executive committee and proceedings of the Board of Regents for the year ending June 30, 1913. 21 pp. (Publ. 2250.)
- Report of the Secretary of the Smithsonian Institution for the year ending June 30, 1913. iii, 119 pp., 1 pl. (Publ. 2249.)

The general appendix to the Smithsonian Report for 1913 was in type, but actual presswork was not completed at the close of the fiscal year. In the general appendix are the following papers:

- The earth and sun as magnets, by George E. Hale.
- The reaction of the planets upon the sun, by P. Puiseux.
- Recent progress in astrophysics, by C. G. Abbot.
- The earth's magnetism, by L. A. Bauer.

- Modern ideas on the end of the world, by Gustav Jaumann.  
 Recent developments in electromagnetism, by Eugene Bloch.  
 Wireless transmission of energy, by Elihu Thomson.  
 Oil films on water and on mercury, by Henri Devaux.  
 Water and volcanic activity, by Arthur L. Day and E. S. Shepherd.  
 Ripple marks, by Ch. Epry.  
 Notes on the geological history of the walnuts and hickories, by Edward W. Berry.  
 The formation of leafmold, by Frederick V. Coville.  
 The development of orchid cultivation and its bearing upon evolutionary theories, by J. Costantin.  
 The manufacture of nitrates from the atmosphere, by Ernest Kilburn Scott.  
 The geologic history of China and its influence upon the Chinese people, by Eliot Blackwelder.  
 The problems of heredity, by E. Apert.  
 Habits of fiddler-crabs, by A. S. Pearse.  
 The abalones of California, by Charles L. Edwards.  
 The value of birds to man, by James Buckland.  
 Experiments in feeding hummingbirds during seven summers, by Althea R. Sherman.  
 What the American Bird Banding Association has accomplished during 1912, by Howard H. Cleaves.  
 The whale fisheries of the world, by Charles Rabot.  
 The most ancient skeletal remains of man, by Aleš Hrdlička.  
 The redistribution of mankind, by H. N. Dickson.  
 The earliest forms of human habitation, and their relation to the general development of civilization, by M. Hoernes.  
 Feudalism in Persia; its origin, development, and present condition, by Jacques de Morgaa.  
 Shintoism and its significance, by K. Kanokogi.  
 The Minoan and Mycenaean element in Hellenic life, by A. J. Evans.  
 Flameless combustion, by Carleton Ellis.  
 Problems in smoke, fume, and dust abatement, by F. G. Cottrell.  
 Twenty years' progress in marine construction, by Alexander Gracie.  
 Creating a subterranean river and supplying a metropolis with mountain water, by J. Bernard Walker and A. Russell Bond.  
 The application of the physiology of color vision in modern art, by Henry G. Keller and J. J. R. Macleod.  
 Fundamentals of housing reform, by James Ford.  
 The economic and social rôle of fashion, by Pierre Clerget.  
 The work of J. van't Hoff, by G. Bruni.

#### SPECIAL PUBLICATIONS.

The following publications were issued in octavo form:

##### *Publication lists.*

- Classified list of Smithsonian publications available for distribution April 25, 1914. Published April 25, 1914. vi+32 pp. (Publ. 2268.)  
 Publications of the Smithsonian Institution issued between January 1 and June 30, 1913. July 15, 1913. 2 pp. (Publ. 2228.)  
 Publications of the Smithsonian Institution issued between January 1 and September 30, 1913. October 14, 1913. 4 pp. (Publ. 2244.)  
 Publications of the Smithsonian Institution issued between January 1 and December 31, 1913. January 22, 1914. 4 pp. (Publ. 2257.)

- Publications issued by the Smithsonian Institution between January 1 and March 31, 1914. April 10, 1914. 1 p. (Publ. 2267.)
- Opinions rendered by the International Commission on Zoological Nomenclature, Opinions 57-65. March 26, 1914. Pp. 131-169. (Publ. 2256.)
- An account of the exercises on the occasion of the presentation of the Langley Medal and the unveiling of the Langley Memorial Tablet, May 6, 1913, including the addresses. October 13, 1913. 26 pp., 4 pls. (Publ. 2233.)

*Harriman Alaska series.*

- Vol. 14. Monograph of shallow-water starfishes of the north Pacific coast from the Arctic Ocean to California. Part I, text; part II, plates. By Addison Emery Verrill. April 30, 1914. xii+408 pp., 110 pls. (Publ. 2140.)

PUBLICATIONS OF THE UNITED STATES NATIONAL MUSEUM.

The publications of the National Museum are: (a) The annual report to Congress; (b) the proceedings of the United States National Museum; and (c) the bulletin of the United States National Museum, which includes the contributions from the United States National Herbarium. The editorship of these publications is vested in Dr. Marcus Benjamin.

The publications issued by the National Museum during the year comprised 49 papers of the proceedings, 2 annual reports, 9 bulletins and parts, and 9 parts of Contributions from the National Herbarium.

The issues of the proceedings were as follows: Vol. 45, papers 1976, 1985, 2005, 2006, and 2007; vol. 46, papers 2008 to 2042, inclusive; vol. 47, papers 2043 to 2051, inclusive; Annual Report of the United States National Museum for 1912; and Annual Report of the United States National Museum for 1913.

The bulletins were as follows:

- Bulletin 50, part 6, Birds of North and Middle America. By Robert Ridgway.
- Bulletin 71, part 3, A monograph of the Foraminifera of the North Pacific Ocean, Part III, Lagenidæ. By Joseph Augustine Cushman.
- Bulletin 71, part 4, A monograph of the Foraminifera of the North Pacific Ocean, Part IV, Chilostomellidæ, Globigerinidæ, Nummulitidæ. By Joseph Augustine Cushman.
- Bulletin 80. A descriptive account of the building recently erected for the departments of natural history of the United States National Museum. By Richard Rathbun.
- Bulletin 83. Type species of the genera of Ichneumon flies. By Henry L. Viereck.
- Bulletin 84. A contribution to the study of Ophiurans of the United States National Museum. By Rene Koehler.
- Bulletin 85. A monograph of the jumping plant lice or Psyllidæ of the New World. By David L. Crawford.
- Bulletin 86. A monograph of the genus *Chordeiles* Swainson, type of a new family of goatsuckers. By Harry C. Oberholser.
- Bulletin 87. Culture of the ancient pueblos of the upper Gila River region, New Mexico and Arizona. By Walter Hough.

In the series of Contributions from the National Herbarium there appeared:

*Volume 16.*

- Part 10. *Annona sericea* and its allies. By William E. Safford.  
 Part 11. Nomenclature of the Sapote and the Sapodilla. By O. F. Cook.  
 Part 12. A monograph of the *Hauyee* and *Gongylocarpeae*, tribes of the *Onagraceae*. By J. Donald Smith and J. N. Rose.  
 Part 13. *Botrychium virginianum* and its forms *Sphenoclea zeylanica* and *Caperonia palustris* in the southern United States. By Ivar Tidestrom.

*Volume 17.*

- Part 3. Mexican grasses in the United States National Herbarium. By A. S. Hitchcock.  
 Part 4. Studies of tropical American ferns. By William R. Maxon.  
 Part 5. Studies of tropical American Phanerogams—No. 1. By Paul C. Standley.

*Volume 18.*

- Part 1. Classification of the genus *Annona* with descriptions of new and imperfectly known species. By W. E. Safford.  
 Part 2. New or noteworthy plants from Colombia and Central America—4. By Henry Pittier

There was also reprinted an edition of 200 copies each of parts A, K, and P of Bulletin 39, United States National Museum, directions for collecting birds, by Robert Ridgway, directions for collecting and preparing fossils, by Charles Schuchert, directions for collectors of American basketry, by Otis T. Mason; an edition of 500 copies of Bulletin 67, directions for collecting and preserving insects, by Nathan Banks; an edition of 2,000 copies of list of publications issued by the United States National Museum from 1906 to 1912, reprinted from annual reports with altered pagination; and an edition of 1,300 copies of a list of publications of the United States National Museum issued during the fiscal year 1912-13, reprinted from the annual report with altered pagination.

PUBLICATIONS OF THE BUREAU OF AMERICAN ETHNOLOGY.

The publications of the bureau are discussed in Appendix 2 of the Secretary's report. The editorial work is in the charge of Mr. J. G. Gurley, who has been assisted from time to time by Mrs. Frances S. Nichols.

Two bulletins and a "separate" from another bulletin were issued during the year, as follows:

- Bulletin 53. Chippewa music—II. By Frances Densmore.  
 Bulletin 56. Ethnozoology of the Tewa Indians. By Junius Henderson and John P. Harrington.  
 Coos: An illustrative sketch. By Leo J. Frachtenberg. Extract from Handbook of American Indian Languages (Bulletin 40), part 2.

At the close of the year two annual reports and several bulletins were in press.



## PUBLICATIONS OF THE SMITHSONIAN ASTROPHYSICAL OBSERVATORY

Volume III, *Annals of the Smithsonian Astrophysical Observatory*, by C. G. Abbot, F. E. Fowle, and L. B. Aldrich. July 16, 1913, xi+241 pp., 7 pls. (Publ. 2230.)

## PUBLICATIONS OF THE AMERICAN HISTORICAL ASSOCIATION.

The annual reports of the American Historical Association are transmitted by the association to the Secretary of the Smithsonian Institution, and are communicated to Congress under the provisions of the act of incorporation of the association.

Volumes 1 and 2 of the annual report for 1911 were published November 10, 1913, and January 14, 1914, respectively, with contents as follows:

*Volume I.*

Report of the proceedings of the twenty-seventh annual meeting of the American Historical Association. By Waldo G. Leland, secretary.

Report of the proceedings of the eighth annual meeting of the Pacific coast branch. By H. W. Edwards, secretary of the branch.

The archives of the Venetian Republic. By Theodore F. Jones.

Materials for the history of Germany in the sixteenth and seventeenth centuries. By Sidney B. Fay.

The materials for the study of the English cabinet in the eighteenth century. By Edward Raymond Turner.

François de Guise and the taking of Calais. By Paul van Dyke.

Factions in the English privy council under Elizabeth. By Conyers Read.

Anglo-Dutch relations, 1671-72. By Edwin W. Pablow.

American-Japanese intercourse prior to the advent of Perry. By Inazo Nitobe.

Colonial society in America. By Bernard Moses.

French diplomacy and American politics, 1794-95. By James Alton James.

The insurgents of 1811. By D. R. Anderson.

The tariff and the public lands from 1828 to 1833. By Raynor G. Wellington.

The "Bargain of 1844" as the origin of the Wilmot proviso. By Clark E. Persinger.

Monroe and the early Mexican revolutionary agents. By Isaac Joslin Cox.

Public opinion in Texas preceding the Revolution. By Eugene C. Barker.

Relations of America with Spanish America, 1720-1744. By H. W. V. Temperley.

The genesis of the Confederation of Canada. By Cephas D. Allin.

Proceedings of the eighth annual conference of historical societies.

List of European historical societies.

Twelfth report of the public archives commission. By Herman V. Ames, chairman.

Appendix A. Proceedings of the third annual conference of archivists.

Appendix B. Report on the archives of the State of Colorado. By James F. Willard.

Appendix C. List of commissions and instructions to governors and lieutenant governors of American and West Indian Colonies, 1609-1784.

Writings on American history, 1911. By Grace G. Griffin.

*Volume II.*

Ninth report of the historical manuscripts commission: Correspondence of Alexander Stephens, Howell Cobb, and Robert Toombs.

The report for 1912 was sent to the printer on January 31, 1914, and at the close of the year was nearly ready for distribution. The contents are as follows:

Report of the proceedings of the twenty-eighth annual meeting of the American Historical Association.

Report of the proceedings of the ninth annual meeting of the Pacific coast branch. By H. W. Edwards, secretary of the branch.

Royal finances of the reign of Henry III. By Henry L. Cannon.

Antecedents of the Quattrocento. By Henry O. Taylor.

The new Columbus. By Henry P. Biggar.

The charter of Connecticut. By Clarence W. Bowen.

The enforcement of the alien and sedition acts. By Frank M. Anderson.

The reviewing of historical books. By Carl Becker.

Briefer papers read in conferences:

A. Libya as a field of research. By Oric Bates.

B. The international character of commercial history. By Abbott P. Usher.

C. Some new manuscript sources for the history of modern commerce. By N. S. B. Gras.

D. The study of South American commercial history. By Charles L. Chandler.

E. On the economics of slavery, 1815-1860. By Ulrich B. Phillips.

F. On the history of Pennsylvania, 1815-1860. By P. Orman Ray.

G. Historical research in the far west. By Katherine Coman.

Proceedings of the conference on military history.

Proceedings of the ninth annual conference of historical societies:

Genealogy and history. By Charles K. Bolton.

The Massachusetts Historical Society. By Worthington C. Ford.

Appendix: Reports of historical societies, 1912.

Thirteenth report of the Public Archives Commission:

Appendix A. Proceedings of the fourth annual conference of archivists.

Plan and scope of a "Manual of Archival Economy for the use of American Archivists," By Victor H. Paltsits.

Some fundamental principles in relation to archives. By Waldo G. Leland.

The adaptation of archives to public use. By Dunbar Rowland.

Appendix B. Report on the archives of the State of Louisiana. By Prof. William O. Scroggs.

Appendix C. Report on the archives of the State of Montana. By Paul C. Phillips.

Classified list of publications of the American Historical Association, 1885-1912.

Tenth report of the historical manuscripts commission:

Letters of William Vans Murray to John Quincy Adams, 1797-1803. Edited by Worthington C. Ford.

PUBLICATIONS OF THE SOCIETY OF THE DAUGHTERS OF THE  
AMERICAN REVOLUTION.

The manuscript of the Sixteenth Annual Report of the National Society of the Daughters of the American Revolution for the year ending October 11, 1913, was communicated to Congress June 16, 1914.

## THE SMITHSONIAN ADVISORY COMMITTEE ON PRINTING AND PUBLICATION.

The editor has continued to serve as secretary of the Smithsonian advisory committee on printing and publication. To this committee have been referred the manuscripts proposed for publication by the various branches of the Institution, as well as those offered for printing in the Smithsonian publications. The committee also considered forms of routine, blanks, and various matters pertaining to printing and publication, including the qualities of paper suitable for text and plates. Twenty meetings were held and 121 manuscripts were acted upon.

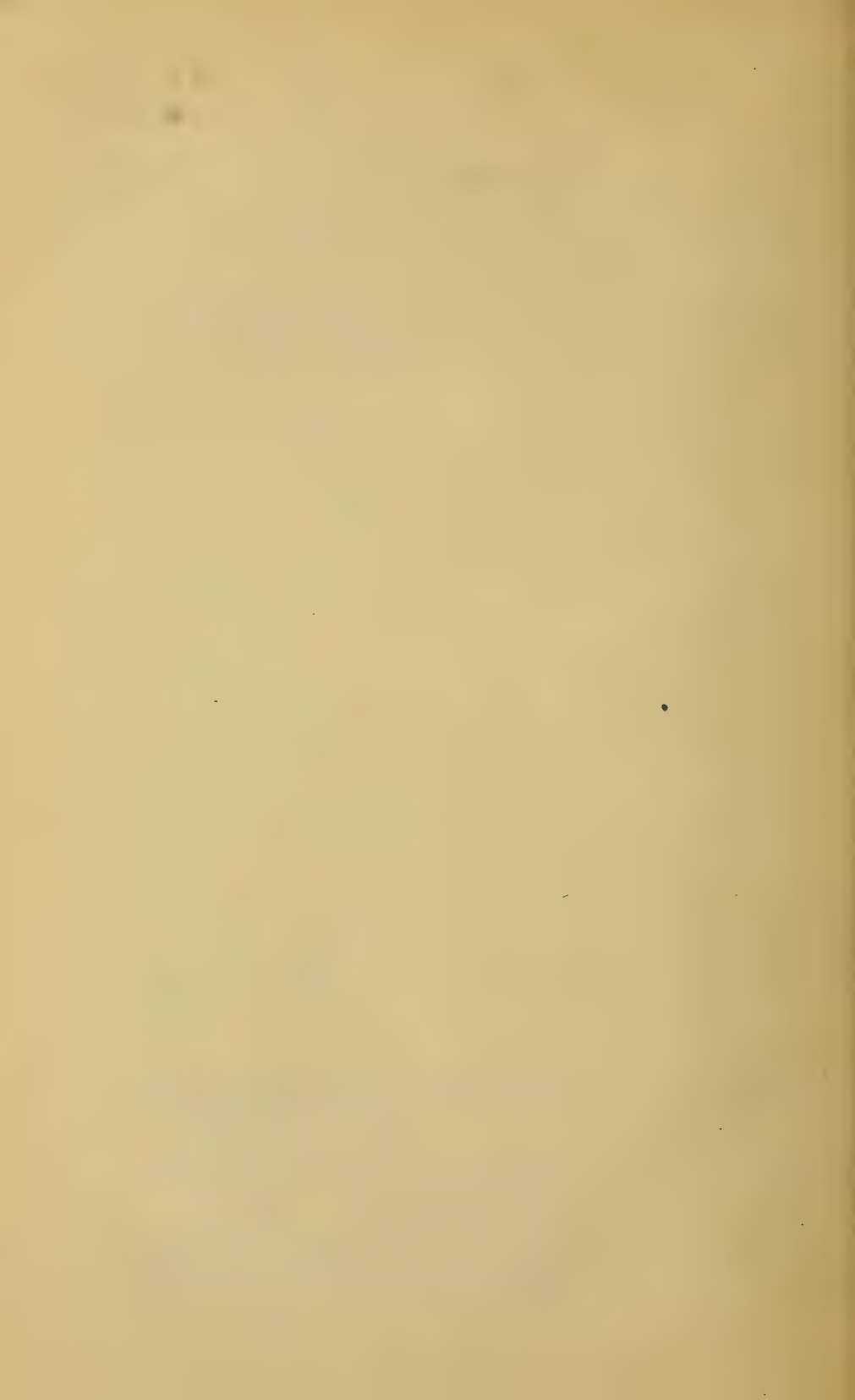
Respectfully submitted.

A. HOWARD CLARK, *Editor.*

Dr. CHARLES D. WALCOTT,

*Secretary of the Smithsonian Institution.*





















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